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THE HISTORICAL METHOD OF TEACHING CLINICAL MEDICINE*

CHARLES P. EMERSON
Indiana University School of Medicine

This is not a formal paper; it is a purely informal Round Table talk. We had no thesis which we now throw onto the table and with which we challenge you. We shall, however, ask questions and shall try to answer them. We may try to heckle you, and you are quite at liberty to heckle us, as we proceed to recommend for your consideration the advantages of the historical method of teaching clinical medicine.

We now speak only of clinical medicine; not of scientific medicine. The latter, the more important branch of medicine, has its own methods. By limiting now our subject to clinical medicine, we do not for one moment imply a criticism of the other. They are different subjects, and to be treated differently. Both should be taught. Clinical medicine is separate from and differs from scientific medicine. It has a right to, and should, develop its own methods of attack. What we now present for your consideration is that the historical method is one of the most valuable of them all.

The stream of progressive medical thought is rapid and powerful. Each decade presents so many new and important problems that unless a man can keep his head above the water, he is likely soon to drown. That is, unless our students can keep up with a rapidly developing and changing profession they soon fall behind; they soon become anachronisms in their profession; they soon are at the mercy of those who sell new biological products or new physical apparatus.

This course in the history of medicine of 18 hours is not a course in medicine; we merely by means of it try to create in the student's mind an emotional attitude to which daily in the ward rounds we can appeal. We often refer to the course as one in the psychology of prejudice. We ask them why as students they accept without argument and with too much enthusiasm any new surgical operation, a new drug, antitoxin, serum or vaccine, and yet are too "naturally" hostile to physical therapy, to dietetics, psychotherapy and other simple therapeutics. We warn them that unless they can appreciate, in part at least, their prejudices that they cannot maintain a safe position in the current of a rapidly progressing clinical medicine. The question is not one of the "false" and the "true". Our evolution seldom denies the beliefs of yesterday. It is a question of emphasis, and we all are creatures of prejudice. We

*Round Table Conference: Thirty-seventh Annual Meeting, Cleveland, Oct. 26, 1926.

can scarcely avoid being this. We might well admit it. As teachers we should teach our students to recognize this fact, to evaluate their prejudices and so to compensate for them, and one of the best means of doing this is to emphasize the lessons taught by history.

With us the course of the history of medicine is not a course in ancient medicine but of the medicine of today interpreted by that of other ages and other peoples. We do not in the first lecture discuss the primitive medicine of uncultured races but the primitive elements in the practices of today. There is plenty of it here, enough to make a savage proud. True, it passes under modern names, it is concealed under the scientific trappings of the twentieth century, but here it is, with only empiricism, habit, tradition, or superstition, to recommend it.

Then we discuss Egyptian medicine. We describe briefly the few references to medicine and surgery on Egyptian monuments and in tombs which date prior to the 15th century B. C. That was quite good medicine: what there was of it. Then follows a hard lesson. The students cannot understand how a medicine can be as old as that and be good. How can it be "good" without the aid of the pre-medical and preclinical sciences?

One of the first and most important lessons for students to learn is that the old may be "good", it may be even better than the modern. That in "goodness" which is important is the intellectual honesty which it expresses; the reasonableness of it. We remind our students that the architecture of old Greece, developed without surveyors' instruments or steam winches, is "good", is in fact an example of excellence for the ages; that the art and literature of Greece is "good", is marvelous even today; and that the medicine of Hippocrates was a tiny stream but of crystal clear thought, in some particulars better in quality than the ocean of slightly muddy water which the mass of illy applied science (splendid, of course, as science) has made of the clinical medicine of today.

The Egyptian hair tonic of the 15th century B. C. which consisted of mixtures of equal parts of the fats of the lion, hippopotamus, crocodile, goose, serpent and ibex sounds absurd, but it all was good fat; another, consisting of cerebrospinal fluid and writer's ink, showed good reasoning. In the first place, as I understand it, few Egyptians ever saw clearer water than the muddy Nile. They had few clear gushing springs, and so the crystal clear fluid from the spinal canal must have seemed to them a wonderfully suitable fluid. As for writer's ink, any one with grey hair knows that that has its uses. Compare those with the hair tonics of today. The point we

are making is that in these two prescriptions there is nothing of the dirty therapy of two centuries ago. Yes, they had their incantations and their charms, and so have we (under other names). They had their foolish prescriptions, and so have we our list of popular, harmless and worthless, placeboes.

But the most important lesson from Egypt is that after the 15th century B. C. came the domination of the priests and then came the Sacred Books of Thoth in which were written the dogmatic therapies which ruled for several hundred years. If a patient died and investigation showed that the doctor had not treated his patient in the way recorded in those books, then the doctor was subject to severe punishment. The priests had gained a strangle-hold on medicine and finally killed it by standardizing it. That is the lesson. Any attempts to standardize methods of therapy present, first, advantage, and, later, elements of danger. The best of standardization if continued in force too long, and it always tends to continue too long, then becomes a straight jacket restraining a developing truth. Of course, this is not the whole truth. Who can state that?

In most stock companies 51 per cent. of the votes elect the president, the executive committee, and all the other officers. We may well be happy if any doctrine we teach is backed up by 51 per cent. of the truth. We teach that all and every attempt to standardize therapy, medical schools, hospitals, anything you will, tends to become a danger after the immediate reason for said standardization shall have passed, and we warn our students to remember this. Egypt, while proving nothing, furnished a nice text for a lecture, with at least 51 per cent. we believe of evidence in its favor.

The priests of Egypt were, of course, not only the professional theologians of that day, but were in control of politics, and probably of education and of industry. They certainly controlled Egyptian medicine and with so firm a grip that they strangled it. That gives us a text for a lecture on the influences for good and the influences for evil which today industry, industrial boards, law, insurance companies, philanthropic movements, etc. are exerting on our profession as they use us, as they certainly do, to further their ends. In other words, medicine to be safe and helpful must remain free and never willingly become the tool of other powerful interests. But we will return to that point a little later.

Next, we mention the medicine of Babylonia. Our students find that study interesting. Historians say that early Babylon had many doctors practicing many specialties; not good medicine, but medicine, nevertheless, and rather surprisingly good surgery. Then came the law maker Hammurabi, whose edicts prescribing the size of the

medical fees and the penalties for medical failure are still preserved for us to read.

We ask the students to think carefully whether the medical men should allow themselves to be controlled in their practices by any system of law prescribed by laymen. We teach that they should not. We urge that while the medical man should be very willing, eager, and helpful in suggesting, framing and passing of laws in the interest of public health, yet the medical man should never seek to obtain or allow his friends to obtain for him legislation which is in his favor or unfavorable to his competitor, for they who today forge shackles for others have made future fetters for themselves and for the next medical generation. The law is beneficial if it keeps the poorly trained man, no matter how "regular" his school, out of practice; it is a two-edged sword if it merely keeps the "other schools" out. Medical men must be free to demonstrate their power to help, but they should not try to prevent others doing the same. So it was by too much law that Hammurabi killed whatever medicine existed in Babylon. At least we have the very interesting statement by Heroditus that when he visited Babylonia there were no physicians there. So we warn our students against regulative medical legislation, legislative committees of medical societies, etc. All of this may seem far fetched but we believe it contains 51 per cent. of truth.

Next comes a very important chapter in medical history, the medicine of the Jews. This is not so ancient history as it sounds for the medicine of the Old Testament was also the medicine of the Puritan church of New England, and is today almost verbatim that of our fundamentally minded patients. The student now begins to wake up. He is interested to learn that the Jews had a fine system of public health but, no doctors; at least those that they did have were in poor repute. He listens to the story of King Asa who consulted the physicians and not the priests and therefore soon slept with his fathers. Then he begins to realize that the theology of the Jews ruled, and that according to their theology all physical disease is the just punishment for some sin; therefore the therapy for disease is to repent and sin no more. That that belief is prevalent now in the minds of many is evident from the oft heard cry of patient or widow, "What have we done to deserve this"?

Of course, as long as a people believes that all sickness is punishment for sin, modern pathology would offer very little of interest to them. Then follows a discussion which interests the religiously minded students. Were not the Jews in a larger degree than we grant right? After all, is not most disease the indirect result of

sin? First, you should remember that the Jews always spoke, not of the individual, but of the family and of the race. The modern emphasis almost exclusively on the individual has existed less than three centuries.

What is the truth about disease? You may take forty-nine exceptions to what I say, but what was the result of all the research work which finally conquered typhus fever? Merely the danger of certain forms of vermin. Did it require preventive medicine to show that man should not harbor vermin? Has not natural man enough self respect to object to vermin whether dangerous or not? Isn't it true that research work solved the riddle of the plague by showing the danger of rats and their fleas? Couldn't our ancestors, long before modern medicine had its birth, have developed self respect enough actively to avoid the company of rats and their fleas? Isn't it true that each person to get typhoid fever has swallowed something which should be in the sewer? Is sewerage any more disgusting now than it was a thousand years ago?

What has been the lesson from the study of tuberculosis? Merely that if we could for thirty years control the sputum of tuberculous patients that tuberculosis would disappear. Isn't it rather an interesting commentary on our instincts of cleanliness that it took a lot of research work in preventive in medicine to show the danger of that dust which our ancestors knew was dried sputum?

Consider for a moment the venereal diseases, the most potent of all disease destroyers of health and happiness. How long ago was the seventh commandment published? Was not sexual immorality just as wicked three thousand years ago as it is now? Yet, when did we begin actually to clean up our red light districts? Not to disapprove of them, but actually to clean them up? Not until it was shown that this sin was also very dangerous. What a commentary on the sincerity of our loyalty to social purity that Christian society's active fight against venereal diseases dates back only to the time when it was proven that venereal disease cost the state dearly in terms of insanity and feeblemindedness!

Isn't it true that the conquering races of antiquity were themselves conquered in large degree by the diseases of their slaves? Isn't this the real reason why Egypt, Greece and Rome fell? Is slavery wrong merely because it is dangerous? So it is in the case of nearly every great disease. Moralize, and you find that it should not have required medical science to defeat it. Man already had enough light to warn him. So it is also in the case of our mental breakdowns. Nearly every case of these is witness to the fact that some well known law of hygiene has been broken.

How rapidly we now are returning to the point of view of the Jews. The Jews believed that physical and mental and moral defects were family defects, and sometimes punished not only the convicted man but stoned his wife and his children also. Is not that the most up-to-date attitude of social workers today concerning the feeble-minded, criminals, paupers and insane? Is it not true that the diseases, and the weaknesses which lead to diseases, of the individual in many cases really date back to vices of ancestors? But does this weaken our test of modern medicine? Not at all. We accept the medical philosophy of the Jews and the medicine of today. We, for illustration, may believe it was political crimes which lead to the recent great war; yet we insist that the boy wounded in that war, and innocent of its cause, have the best of medical treatment. The family and the race are two units; the patient is a third. Each presents its individual problems. The moral of all this for our medical student is that he should realize his future responsibility not only to the patients but to the families and to the nation.

Next we study Greece. We teach the students that the medicine of Hippocrates was "good" medicine, still a model of excellence. Also that the Greek profession was never dominated by priest nor by politician. When the student asks the reason why, he is reminded that the Greeks could never unite on anything; no politician ever succeeded in uniting the Greek states into an effective union; and no priest ever combined the priests of Greece in a common cause. One result was that individualism which for a while created a market for the best which artist, poet, or philosopher, could produce. And they did produce a fine literature, a beautiful poetry, a superlative art, and a splendid medicine. We often think of the Greeks as a "gifted" race and attribute some of their excellence to heredity. But the Greeks were not a race. They were such a mixture of bloods that one of the great Greek scholars has called them "the superb mongrels of history". Theirs was not an inherited genius; it was a cultural development, and if the Greeks could do it, so can we.

So we teach the students the virtue of the individual's efforts to excel, and the dangers of standardized group, or society medicine. The students should be taught that they have their individual responsibilities; they should be warned that no man can with honor "pass the buck" to others. The laboratories may give a man invaluable assistance but it is only assistance. The laboratory cannot make his diagnoses for him. The Wassermann test is very valuable, so are the roentgen-ray examinations, bacterial cultures, and blood chemistry, but the responsibility of using the information they give

rests not on the serologist, the roentgenologist et al, but on the practicing physician himself. There cannot be safe division of responsibility in diagnosis or in the treatment of a patient. Others may help us much, but the responsibility belongs to the physician alone. One reason why the Greek physician was able to gain such eminence is that he jointed with artist, poet and philosopher in an intense struggle for individual eminence.

Greek medicine can be used as a good illustration of the general statement that in each age medicine is in large measure the reflection of the culture of that day. Egypt and Babylonia, in their time, were absolute monarchies, and sooner or later medicine came under the control of absolute rulers. Judea was an absolute theocracy and medicine came under the control of powerful theologians. The Greeks were individualists with a culture which put a premium on excellence and the same conditions which produced fine artists, fine dramatists, fine poets and fine philosophies produced Hippocrates also.

Next we mention the Saracens with their early democracy and with their fairly good medicine:— what there was of it. Then came the medieval times with its ignorance, its superstitions and naturally its awful medicine, awful because its theology was awful, for during the Dark Ages they held that the body was vile, an impediment to the soul, and that spiritual gifts might be gained by punishing and reviling the body. This is well illustrated by Professor Brown's story of the difference, during the Crusades, in the therapy of the Christian Franks and the Saracens. It seems that a Saracen doctor treating a woman with tuberculosis prescribed milk and rest. When the Frankish doctor got control of the case he cut a cross on her head and rubbed salt into the cut in order that it might be painfully evident, whereupon she died. That is not intended as cruelty. In those days theology taught that to mortify the body purified the soul. This medicine was an accurate reflection of their culture. One would not expect good medicine from such a culture.

In modern medicine especially, we see clearly that medicine is and must be a reflection of contemporaneous culture. Each discovery of science, and each invention of the mechanical arts is likely sooner or later to find its application in medicine. For illustration, radium and the roentgen ray. But culture is national and therefore medicine must in some degree at least be national. This may be the reason why the attempt to transplant a German medical school system onto American soil was not more successful. We will succeed best if, avoiding excesses, we try to develop American medicine as a reflex of American culture.

The American genius is characterized by its marked initiative, fertility in invention, and gift of organization. In medicine, therefore, these should be developed. Yet in these there also is danger. Good organization means efficiency and yet it is easy to forget the quality of the product in our pride of the process. For illustration, supposing we should be asked to name the best automobile factory in America, doubtless you would name the Ford plant. You would call attention to its system, to its efficiency, to its engineers, all of the highest quality, but you wouldn't claim that this, the best organized factory in America, produces the best automobile. No: the quality of the organization is one thing, and the product of that organization is another thing. So a man will boast of the hospital or clinic in which he was operated on—and not even know the name of the man who performed the operation. That is not safe medicine.

Invention, again, gives the medical man more, new, and better tools. This should mean progress, and yet the American doctor now is depending more and more blindly on these to do his work for him, and is becoming more and more helpless without them. The more elaborate the tool, the better trained must be the man who uses it. Our laboratory men are becoming better and better trained and now naturally are challenging the right of the doctor to pocket the fee for the diagnosis they make or the treatment they give. If diagnosis and treatment could be turned over to laboratory specialists, then, in the interests of progress, the general practitioner should suffer. But that is inherently impossible. Only the man who knows intimately the individual patient's physical, emotional, family and industrial problems can know just how much the specialist can help his patient. Multiply the means for better diagnosis and treatment at his disposal and you are only increasing the problems of the physician, not lightening them.

By greatly increasing its benefits to humanity, medicine makes it also necessary that medical schools graduate better and still better trained general practitioners. Too great a loyalty to organization, too great a dependence on tools, too great a pride in quantity production, is one reason why the American medical schools today are not producing their best product. Tools and organizations for standardized mass production is splendid, but we should teach our students, in the light of history, that they must live up, not to the most conspicuous elements, but to the best that there is in their culture, should understand its weakness, and should try to correct some of the evils which too great loyalty to that culture may produce.

And finally, the lesson of history also suggests that American medical schools now should emphasize more not only greater accu-

racy in training but also the general culture of their graduates, their wider sympathies, in order to meet the wider social problems which medicine alone can answer.

DISCUSSION

DR. GEORGE M. KOBER, Georgetown University School of Medicine: I agree fully with all Doctor Emerson has said and he said it so well. I take occasion, however, to differ with him on the subject of standardization. We know what standardization has done for the industries in the United States, and the great results already achieved are likely to grow in value.

As the author of a plea for a standard medical curriculum in 1904, I claim that this Association, by the adoption of a reasonable standard in 1905, deserves great credit for the advancement of medical teaching. Those who are familiar with the chaotic condition of the curricula of our medical schools twenty-five years ago will remember that between 17 and 18 per cent of all the graduates between 1896 and 1902 were found by the state board to be unfit for one of the most important and responsible of all professions. When we consider that the failures in 1924 were 7.3 per cent, we can reasonably claim that standardization has achieved good results.

I want to emphasize the fact, that the standards adopted by this Association and the Council on Medical Education of the American Medical Association have unquestionably succeeded in turning out better practitioners, which is a very important achievement when the welfare of the human race is considered. We know that in this country the death rate has been cut almost one-half and human life has been prolonged fully fifteen years in the last fifty years, the largest gains having been made during the last 25 years. This could not have been done without higher standards of medical education, including of course, hygiene and public health. I remember in Washington our infant death rate in 1895 was 297 per 1,000. According to a report last year the infant mortality has fallen to 80 per 1,000. Similar reductions have been made in tuberculosis, typhoid fever and other preventable diseases. There has been a good deal said in opposition to uniform standards; all I have to say is that the results of uniform minimum standards in medical education have justified their adoption.

DR. ROBERT WILSON, Medical College of the State of South Carolina: Does Dr. Emerson want us to draw the conclusion, which seems inevitable, that medicine is the reflection of the culture of the age in which we live? Herodotus tells us of the extreme development of specialization among the ancient Egyptians. We learn the same thing with regard to the Romans at a later day. We find that specialization reached an extreme degree. Both of those periods were periods of decadence. We hear this morning the tendency is toward specialization. Is it a conclusion that that is the reflection of the decadent age?

DR. E. P. LYON, University of Minnesota Medical School: I am glad to agree to the general proposition. I wish to enter a protest against the 49 versus 51 per cent theory. I get the idea that it is proposed to do a thing

—for example, adopt a type of therapy—because 51 per cent of the evidence is in favor of it; and that you should hold your mind open to switch to the opposite view when it in turn has 51 per cent of the evidence, ten years later. In my line of work, if we had one hundred experiments in physiology and forty-nine came out one way, and fifty-one the other way, we would say that no conclusion was reached and that no conclusion whatsoever could be drawn from such facts and no action could be taken on the basis of them, except to make more experiments and better experiments. I have a suspicion that our students are taught to do things in therapy which have been done over and over again, because they have been done over and over again—that is, are established in practice—and not because of even 51 per cent as against 49 per cent.

I know the pressure that physicians are under to "do something" for the sick man. I know the effect of any kind of "something" on the sick mind, even though it may have no effect on the pathological process. I think it legitimate to teach our students such procedures, not because 51 per cent of the evidence is in favor of them, but frankly as measures of suggestive value to the patient or as experiments from the point of view of the doctor. The doctrine of fifty-one versus forty-nine is pernicious. It is not good science. It ought not to be the basis of action nor of teaching.

Dr. Emerson: We certainly appreciate your forbearance as shown in this discussion.

We admit that standardization is a remarkably useful instrument, but like all tools it must be used wisely. For illustration, in 1906 it was necessary to reform certain medical schools, and as a means to an end a wise standardization was published and these schools promptly closed their doors. It is desirable now to continue to enforce a system of standardization, but certainly not that of 1906 but one adapted to meet the problems of 1926. Yet, today the state boards of medical registration evidently think that our system of standardization of 1906 contains a sort of perpetual truth which warrants its perpetual existence. They refuse to modify the instruments designed to meet the problems of a past day when we need one suited to the problems of today. Can we persuade state boards of this?

Yes, there was specialization in Greece, Rome and Babylonia. Specialization may be a sign of progress, or a sign of decadence. By their fruits we can tell which it was.

I am sorry that Dr. Lyon took so seriously my reference to fifty-one and the forty-nine. I only used the illustration, that in great corporations 51 per cent of the voters do actually decide each question, in order to emphasize the danger of too great confidence that we are always "wholly" right; and specifically to justify my protest against the prevalent too positive attitude on the part of the scientific teachers of the preclinical sciences. We of the clinical side protest that no science is "fundamental" to medicine. The medical man should use all the science he knows as a tool and not as a crutch, and so I think the sooner our medical schools get over the idea that

"science" gives the student a "foundation" the sooner will our medicine become "scientific."

The trouble with our schools is—not long ago a preclinical faculty committee, some of whom were Ph.D.'s and some M.D.'s, not one of whom had ever practiced, not one of whom knew a thing about the responsibility for and the care of a patient, not one of whom had tested himself and knew whether he could help the patient, could inspire confidence on the part of a patient or not—presumed to decide what boys and girls applying for matriculation would ever make good doctors. I just want to ask how could they tell?

May I repeat, we need those scientific men on our faculties, we must have them; but good medicine is not science practically applied; it is consecrated service, and the consecrated man will desire a scientific training in order that his tools may be more varied, in order that his service may be more efficient.

SENIOR STUDENTS AS INTERNES*

RUSSELL H. OPPENHEIMER
Emory University School of Medicine

In May, 1926, a questionnaire was sent out to the deans of all class A medical schools in the United States for the purpose of determining their attitude toward permitting senior medical students to act as internes in hospitals at the same time they are doing the work of their senior year, and to learn what had been their experience as to the effects of such interneships on the quality of scholastic work done by these students.

At the outset, it may be well to state that the questionnaire had no relation whatsoever to the usual clinical clerk services which are a part of the regular curriculum of the medical school. The situation may best be explained by means of an example: a hospital finds itself in need of an interne. There is none available. A medical school is located in the same city with the hospital and it is found that the senior students are willing to accept an interneship in this hospital during their senior year, receiving (generally) their board and room and in return doing as much work as is possible during the hours not taken up by school work.

*Round Table Conference: Thirty-seventh Annual Meeting, Cleveland, Oct. 26, 1926.

QUESTIONNAIRE

1. Are your senior students permitted to act as hospital internes?
2. If so, how many of the present senior class have been doing this work? What is the total enrollment of the senior class?
3. Are those men who are acting as student internes doing the highest grade of scholastic work?
4. Can any reduction in the quality of scholastic work be noticed by comparing their senior year grades with grades of previous years?
5. Do you feel that the men doing student interne work have an increased or lessened interest in the regular class and clinical work of the senior year?
6. What is your personal opinion in regard to senior students acting as internes?
7. Is any action contemplated or have any rules been established, which regulate the acceptance of student interneships?

Remarks:

Fifty-two of the questionnaires sent out were returned. In twenty-eight of these schools it is the practice to permit senior students to act as hospital internes. This is 52.8 per cent. Of the fifty-two schools 28 give permission without reservation; 4 give permission but discourage the practice; 10 give permission with restrictions or under special circumstances only.

The various restrictions mentioned by these schools are (*a*) restriction of appointment to students of high scholastic standing; (*b*) restriction of appointment to hospitals with an A rating; (*c*) restriction to hospitals where the student will be under the direct supervision of a member of the faculty; (*d*) restriction to hospitals directly under the control of the medical school.

The special circumstances mentioned are (*a*) cases of emergency in local hospitals; (*b*) instances where a student is badly in need of financial help.

It is interesting to note that in those schools which give permission without restriction, the number of students availing themselves of the opportunity varies from 1.6 per cent. to 5 per cent., or an average of 19.0 per cent. In schools where permission is granted with restrictions, the number making use of the opportunity is found to be from 4.3 per cent. to 12.5 per cent., or an average of 8.7 per cent.

At first, one might think questions 3, 4, 5, were redundant. The reason for inserting such similar questions was in order to facilitate the expression of opinion on the effect which student interneships have on the scholastic work of the student.

The third question asks definitely whether those men in the senior class who are acting as internes are doing the highest grade of scholastic work. In all except one of the schools replying that such students are doing the highest quality of scholastic work, per-

mission is granted only in exceptional cases or the students are chosen from the standpoint of their scholastic ability. In the two schools in which these internes are selected entirely on the basis of scholastic records, it is natural that the question should receive a positive answer. Of the remaining nineteen schools which grant permission, twelve definitely state that such students do not do the highest grade of class work. The exact interpretation of this fact cannot be made out with the information available. The two possibilities are that the better students do not seek such interneships or that the interneships interfere with class work.

Question 4 asked for a frank statement as to whether or not it could be said that senior interneships have an unfavorable effect on class work. Eighteen schools reported that no reduction in the quality of class work had been noted. Four reported that there was variation on this point, depending on the individual student. Only five schools definitely stated that they felt there was a reduction in the quality of class work done by these men. These five schools are those which do not favor such interneships. This is what we would expect. No special interpretation can be made of the fact that no reduction in the quality of the work has been observed. It seems probable that this arises through failure to make any special observation along this line.

Especially does this seem likely in view of the responses to question 5: Do you feel that the men doing student interne work have an increased or lessened interest in the regular class and clinical work of the senior year? The same schools which noted reduction in the quality of work also noted lessened interest in work, in addition to which seven other schools (or a total of twelve) noticed a lessening of interest. The especial point which it was hoped to determine by this question was whether or not actual hospital association with patients would have a beneficial effect on the student's interest in and attitude toward his work.

The answers to questions 4 and 5 seem contradictory in view of the number noting no reduction in the quality of work but lessened interest in work. It would seem more logical that the hospital association would increase the student's interest while possibly lowering his quality of work, owing to the fact that he would have much less time for study and the reading of medical literature.

A consideration of the magnitude of the senior curriculum in medical schools certainly throws some doubt on the advisability of a student attempting at the same time to do the work of an interne. Surely, there will be a distinct limitation of his opportunity for study

and for acquainting himself with current literature. The question naturally arising is how much will the enforced responsibility and the enforced examination of more patients, which an interneship demands, counterbalance this loss of opportunity for study and reading. It is almost indisputable that where his interneship is primarily concerned in making records for the hospital and doing laboratory work and similar tasks without an intimate contact with capable visiting physicians and surgeons, we can expect that his efforts will result only in a useless reduction in his mental and physical energy, a lessened interest in his scholastic work, and a reduction in the quality of all work which he does. It must also be borne in mind that a large number of hospitals requesting the use of senior students as internes are hospitals which, because of the character of the opportunity which they offer, do not meet with success in securing graduate internes. This, in itself, is sufficient to cause some hesitancy in advocating the practice.

In the replies to question 6, it was noted that practically all deans of medical schools are frankly opposed to senior students acting as hospital internes or are in favor of it only under very restricted circumstances.

It is probable that we can best express the opinions as to the effect of senior internships on the work of the student by quoting directly some of the remarks made at the end of the questionnaire.

(*a*) "In the case of high grade students I think the handicap is less noticeable; low grade students are definitely handicapped by interneships. I do not think it is the wisest policy."

(*b*) "There may be increased interest in that class work relating to the clinical work which falls to their lot as internes. Otherwise, but little change is noted. . . . Where the hospital service is well organized and the student's work as interne can be carefully supervised, it is probably of considerable benefit to the student. Where supervision is lacking and where work occupies so much of his time that he cannot devote the necessary attention during the year to the various clinical subjects, there is probably little of benefit to him."

(*c*) "Honor men usually do not apply for interneships."

(*d*) "I believe that it is very much better for fourth year students to act as internes in the teaching hospital of the medical school than in hospitals not used for teaching purposes. A good many students find it necessary to supplement their incomes while in the medical school. If a student is compelled to do outside work in order to earn money the interneship which usually carries with it

room and board interferes less than other work yielding a similar financial income."

One form of interneship lending itself admirably to the advancement of the student, though not mentioned in the questionnaire, is referred to by one of the deans in his reply. This is the substitute interneship during the summer between the junior and senior years. The value of this summer interneship is found in the fact that the student has learned sufficient of the clinical aspect of medicine to be capable of appreciating the work with which he comes in contact, while at the same time he has the eagerness and desire to learn which is found in any student at the beginning of his study. He is fresh and active and usually is pleased to have many and varied tasks given him. Freed from the routine work of the class room, he is able to concentrate his attention upon the patients assigned him. He appreciates both suggestion and criticism. Naturally, this observation holds true only in those hospitals which either are connected with a medical school or make the teaching of internes one of the first considerations of the hospital staff.

CONCLUSIONS

In summarizing the information and remarks relating to this subject, we can probably formulate the following opinions:

1. Senior interneships are of value to the student only when they are given in hospitals which are controlled directly as teaching units of the medical school or which have as staff members a sufficient number of the medical school faculty to insure to the student careful and persistent supervision of his work.

2. Interneships in hospitals which are not intimately connected with the medical school are either positively detrimental to the student or of very questionable value.

3. Senior interneships tend to lessen the interest of the student in the scheduled work of the curriculum. They limit his opportunity for reading and study.

4. The question of interneships seems to be closely linked with another question: that of the student's need of financial aid. There seems to be some tendency to modify opinion for the benefit of the indigent student.

5. Only students doing entirely satisfactory class work should be permitted to accept interneships.

6. In any instance where a senior student is allowed to act as interne his work should be supervised by some member of the faculty on the staff of the hospital.

DISCUSSION

DR. WALTER L. NILES, Cornell University: I believe that I express the feeling which most of us have regarding this question. It is quite impossible for a man to carry out the work of hospital intern and at the same time carry on his work in the medical school. If we regard our work the fourth year in medical school as desirable, it seems wise not to interfere with that by work in the hospital, particularly as most students subsequently serve internships, and it is our custom not to permit internships during the fourth year. There is a decided tendency toward making the fourth year less of a pedagogical year. I think that is a mistake. If our medical course is any good at all it ought to be continued through the course. There are plenty of opportunities for subsequent training in practical medicine.

DR. CHARLES F. MARTIN, McGill University: In our school the fourth year is the year which is devoted to a great deal of clinical work. The fifth year is considered the hospital year and during that period the student is given a great deal of latitude as to his choice of work. He will be obliged to attend the major clinics, but apart from that he will be given an opportunity to attach himself to any service during the period which he favors most. In that way he develops more or less independently and takes his own chances as to how well he will be able to pass his examinations at the end of the fifth year.

THE GRADUATE PLAN IN MEDICAL EDUCATION*

M. C. WINTERNITZ
Yale University Medical School

This is my first appearance at one of these conferences, and I regret very much that I am to speak about an experiment which is still in its inception, rather than to bring to you the conclusions on a piece of work.

I understand that you are not interested in the philosophy that has induced this experiment, but that you would like to learn the facts. Enough has been said this afternoon so there is no need to elaborate the philosophy. Dr. Miner has enumerated the fundamental principles that are involved in this experiment; Dr. Mathews has

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emphasized the need of further experimentation in teaching methods, as has Dr. Redfield. Undoubtedly many reasons occur to you concerning the benefits to be derived through experimentation in medical pedagogy.

At Yale it is believed that such experimentation is one of the functions of the institution. It tends to make the student alert, it stimulates interest on the part of the faculty and it keeps the subject matter of the courses in a state of flux. Even if no more were accomplished, the faculty are kept alive to the pedagogic problems with which they are confronted from day to day.

An essential preliminary to the experiment under discussion has been the following point of view on the part of the faculty: that the best possible course is the one that adequately presents the fundaments of the subject most briefly. In accordance with this view point, less rather than more time, from year to year, is being requested to present the principles of the majority of the subjects taught. This is believed to be contrary to the usual experience. As a result, 50 per cent. of what was the required curriculum five years ago has been salvaged, and this time is available to the student for review, for advanced work and for leisure.

The principles underlying the experiment being undertaken may be enunciated very briefly. There are definite requirements for admission to the so-called School of Medicine. The phrase "so-called" is used because it is not particularly desired to continue the name "School of Medicine." These requirements are three years of collegiate education with certain specific prerequisites. Under the new system, students who may not have met all of these specific requirements are not necessarily refused. The student who has completed the requisite training in one phase of biology does not necessarily have to be equally well prepared in other phases of science before he may be admitted to further courses. For example, a student may be admitted who has not completed the required courses in chemistry. Obviously, he will be unable to undertake the more specialized work in a subject without the proper preparatory courses. However, there is no reason why this should not be done in other divisions in the university, while the student is engaged in advanced work in other fields of biology included in the courses offered by the School of Medicine.

At Yale, students with diverse training are included in the majority of courses designed primarily as preparation for clinical medicine. Those of you who have had the privilege of instructing such a group of students with varied preparation and different objectives,

will recall the pleasure of such courses, and especially the assistance of the individual's point of view in illuminating the subject, not only for his fellow students but for the instructor as well.

Considerable opportunity for indulgence in this experience has been available, since, for a number of years, graduate students in one or another branch of biology have been encouraged to undertake work in other phases of the subject, not only to broaden the foundation of their basic knowledge, but also to acquaint themselves more thoroughly with different fields in order ultimately to select more intelligently the one in which they desire to perfect themselves. For example, commingled with the candidates for the degree of Doctor of Medicine in the courses of pathology there have been students whose objective was the degree of Doctor of Philosophy in zoology, bacteriology, biochemistry, etc. The latter may not have had any instruction in human anatomy, but have had comprehensive courses in comparative anatomy.

It is, perhaps, heterodox to think of admitting a student to a course in pathology, as it is given in a school of medicine, who has not dissected the human body, but from the experience of five or six years, with ten students a year who have not had this particular training, it can be said frankly that in many cases the student who has not dissected the human body excels his colleague who has had this experience. The latter frequently has a static, rather than a dynamic concept of the body, and for the understanding of pathology in its broader principles, the dynamic point of view is essential.

After considerable experimentation, it has been concluded that it is undesirable to classify students according to classes. The class system has been abolished and students are listed alphabetically, irrespective of year.

The student, on admission to the school, has the privilege of selecting the particular disciplines he desires to pursue from a variety of subjects. Obviously, he cannot undertake any course without the consent of the responsible instructor, who determines the number of students he is able to accommodate, and the preparation of each individual. In this way sufficient latitude is allowed both the student and instructor, with the result that in most departments students are found with varied preparation and at different levels of their professional education.

After a student is admitted to a course, the responsibility of the instructor, in the old sense, is at an end. For example, no roll is called, no tab is kept on the work of the individual, there are no formal daily assignments, and examinations in course or at its end

are abolished. Every effort is made to interest the student in the fundaments of the subject, and he uses his discretion in taking advantage of his opportunities. When the scheduled hours of instruction in a subject have been completed, the student may elect further experience in the same branch, either as a review, advanced work or investigation, or he may withdraw entirely from this discipline and concentrate his efforts in other fields. Obviously, the minimum time alloted to elective work is large and the elective opportunity is proportionately increased for the student who is willing to spread his training in the various essential disciplines over more years.

During the period of what used to be referred to as the "preclinical years" (which is rather an affront to those of us who are in the preclinical years and conceive of the subjects we teach as sciences, not preclinical sciences) these students are not differentiated; that is the ultimate candidates for the degree of Doctor of Medicine and Doctor of Philosophy are considered as one group and every effort is being made to have them take this same point of view. As far as possible, it is desired to have them gain experience in various disciplines before they select their vocation. In other words, it is hoped to circumvent the preconceived idea concerning a vocation, which, unfortunately, is very common, especially among prospective physicians. It is desired to have the student approach the various phases of biology, of which medicine may be designated as an applied branch, with an open mind, to ascertain his ability and the pleasure he derives from the pursuit of any particular subject before he determines the ultimate course he is to pursue for his own greatest advantage. After a varying interval, usually two years, but in some instances one year and in others three years, the student will come to a conclusion concerning his later work, and he will present himself for a qualifying examination, when in his judgment he is properly prepared.

In other words, whether or not it is my ambition to make a pathologist of every student that comes into my particular laboratory is of minor consideration. The student may go fishing, or play golf, or he may go to some other school to learn pathology. He will be tested eventually not on what I think I should have taught him but on his knowledge of pathology, or rather on what the examiners believe he should know of pathology to pursue the particular course he has chosen.

As one would expect, the majority of students enrolling in a school of medicine ultimately become physicians, irrespective of

the course of their method of arriving at the decision. Indeed, the majority of students primarily admitted to the school of medicine desire to arrange their courses in the old fashioned sequence and considerable effort is essential to succeed in having the minority scramble their curricula. Each student has a detailed personal interview before entering the school. An attempt is made to ascertain his preparation and his inclinations. His schedule of work is ultimately decided on the basis of such interviews, with the aid of his counselor, a member of the faculty. Once in course, the sluggish student is advised to curtail his activities and drop a subject. This may be completed in the summer, either in this institution or elsewhere, or because he can only accomplish successfully a limited amount of work it may be essential for him to spend more years than the average in his preparation. On the other hand, the student who acquires knowledge more rapidly, may be able to carry a heavier schedule and within reasonable limits (that is, without too much sacrifice of the time allocated to elective work) may complete his schedule in less than the average period. The student is urged to do as much as he can accomplish primarily for his own, not his instructor's, satisfaction.

Again, it is the student's responsibility to decide when he is prepared to qualify for candidacy for either the degree of Doctor of Philosophy or Doctor of Medicine. These examinations are held four times during the year. The examination for admission to the field of clinical medicine is conducted by a clinical group privileged to request any of their associates, either in the fundamental or applied branches of biological science, to assist in the tests. Likewise, students who desire to enroll for candidacy for the degree of Doctor of Philosophy in the fundamental biological sciences are examined by the particular department involved.

After a student is admitted to the clinical course, an equally reasonable latitude in the arrangement of his work is allowed. Every effort is made to impress the student with the importance of quality, rather than quantity of work to be completed in any period of time. He sets his own pace; more slowly in one instance, more rapidly in another. He has the privilege of utilizing his summers to complete practical work or to further investigations that may have been undertaken during the academic year. Even in this latter period, he may engage in other occupation to a legitimate extent, if this will lighten his burden, or assist him in getting a clearer concept of his studies. At the end of an arbitrary period (usually not less than two years) and after the acceptance of his graduating thesis, he again presents

himself for examination, and if this is successfully completed, he is recommended for the degree.

Obviously, there is nothing new in this plan. It is graduate education as this is known all over the world, even in the United States. Practically, the equivalent requirements for admission to graduate education are included for entrance to the medical school. Under these conditions, why should not the student in the School of Medicine be considered to be on the same intellectual plane as Dr. Mathews' "other graduate students"?

DISCUSSION

DR. B. C. H. HARVEY, University of Chicago: The Yale experiment in medical education is certainly of the greatest interest to all of us and likely to be of the greatest value to all of us. Dr. Winternitz did not express formally the philosophy on which this experiment is based. It is very clear from what he said that they contemplated as the object of medical education the development by the student of intellectual power and the assumption of responsibility for his own faith in himself.

In our work in medical education we must all realize that our duty is to help the student in the best way we can to the attainment of just those objectives. A hundred questions will come up in the minds of each one in connection with this experiment which is being performed. It is yet too early for an answer to be found in them. But, perhaps Dr. Winternitz could tell us something of how the students react to this opportunity for independence. How many of them, when they are free to do what they like, like to give up the study of medicine? Does he ask any of them to give it up? How many of them, in this atmosphere of intellectual freedom, give up their candidacy for the M.D. degree and enroll as candidates for the degrees of Doctor of Philosophy and Master of Science?

DR. M. C. WINTERNITZ: Of course, it is very early to make any statement but the outlook is encouraging. The first tendency was to divert, toward candidacy for the degree of Doctor of Medicine, students who had primarily enrolled in the university with the idea of becoming Doctors of Philosophy in one or another biological science, but the reverse is now manifesting itself, and a few students who have entered the School of Medicine later have decided to pursue courses leading to the degree of Doctor of Philosophy. Certainly, the students manifest greater independence in the selection of their courses, and are quite willing to vary their pace; not only to carry a heavier schedule, but also to drop a subject when they find they can do better work with a reduced curriculum. The attitude of the student toward his work and his instructors has materially improved with the introduction of the new system. These are the more important facts that have been ascertained thus far.

AN EXPERIMENT IN TEACHING PHYSIOLOGY*

ALFRED C. REDFIELD
Harvard Medical School

I hope you will not think that what I am about to present to you is an example of what we consider to be experimentation in the technical sense in the department of physiology at Harvard. As you will see it is a group of observations, or experiences, which are entirely uncontrolled and which are by the nature of circumstances able to contribute to no definite or clearly defined question. Rather what I have been concerned with is more in the nature of a clinical experience, and that is a discipline in which I have had no training myself.

Dr. Edsall has told at previous meetings of this Association of some of our attempts to make the medical student into what I believe Dr. Mathews calls "a real student"; that is, to provide some attention to the better men in order to overcome the tendency of all educational machines which rely on mass production to center on the average and neglect the extremes of the material with which they have to deal.

In this connection he asked me three years ago to serve as tutor in physiology. Briefly, my duties were to look after some of the more capable men during the early years of the medical course while they were concerned in being grounded in the medical sciences.

The essence of the problem, it seemed to me was to find means of assisting these more capable students without in any way disturbing the existing machinery of education. I had to find methods of dealing with men who were anxious to make an additional effort during such free time as they could get without taking from them the responsibilities of the ordinary curriculum.

The original intention was to begin this work with second year students who in our school had completed their work in anatomy, histology, biological chemistry and physiology. If they wanted to work in other fields besides physiology I was to help them get in touch with the proper persons. It appeared during the first year that there was a certain difficulty in getting going. The second year students whom I wanted to get hold of had passed out of my hands. They were concerned with pathology and bacteriology, and it was rather difficult, in many cases, to get them to come to me and do the kind of work which I thought they should do at the beginning.

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It seemed, therefore, desirable to get hold of the men earlier. After our physiology course had been running for a few weeks, I selected from it eight students and told them that they would be expected to take the ordinary examinations in physiology, and advised them to take the lectures which were given two or three times a week. I told them that with regard to the laboratory work they would be entirely excused and I would substitute some special laboratory experiments. These laboratory experiments reduced the amount of laboratory instruction to one-half. Then for the other half of the time I gave them reading to do. This reading consisted in selected chapters from the principal monographs which happen to be available. Such books as Lusk's "Science of Nutrition"; Krogh's "Anatomy and Physiology of the Capillaries"; Haldane's "Respiration" were serviceable. Certain of the Harvey lectures were useful and in rather exceptional cases one could find original papers which it was very desirable to have read. The reading as outlined was always more extensive than any student could possibly do in a week. I indicated the more important selections but they were left to make a certain degree of selection themselves. At the end of each week we met in conference to talk over the work which they had been doing.

That, in a general way, was the paraphernalia for this experiment which has been repeated for three years. I have come to feel that it is the most valuable part of the teaching I do, with one possible exception. It is difficult in experiments dealing with only a total of twenty-four men, to find any clear basis for drawing conclusions.

In the first place, in regard to the method of selection of these men, I have come more and more to feel that it is important to get the very best kind of men.

I have given up almost entirely resorting to the student's previous record in making these selections. I find that I can get a number of men from each class who have gotten almost nothing but "A" marks in the institution from which they have come. Some of them may do well, but they usually fall down when they go to doing things beyond the prescribed work. They have not, very often, developed the sort of initiative which is necessary in order to push along a problem.

Some men have also shown very clearly that despite the fact that they could absorb lectures and ordinary textbooks and such things excellently they could not put together the rather diffused lot of reading which I have given them to do. They get the superficial things and they cannot put them together. I have come to rely

almost entirely on the impression they make when they volunteer to take the course. I talk to them and try to find out which men seem to have strongly developed characters. That is about all there is to the selection.

With regard to how these men do subsequently, it is very difficult to judge. I am certain that they get on the average one grade lower than I would have expected them to do had they stayed with the rest of the class. A man who would have gotten an "A" usually gets a "B" because of the treatment I have been putting him through, and so on. On the other hand, when I question these men after they have become second year students, and later, and ask whether they feel that this experience has been an advantage to them, they tell me without exception that they think so. They may not have been able to collect quite so much ready information in time for the examination, but they have not forgotten any more and they know how to think things up in a way which I hope is somewhat better.

With regard to the object of getting hold of men, I think I can say it has worked out successfully. Roughly speaking, half of the men whom I take on in the year continue in their second and third years working out some problem which they become interested in in their spare time. I think of the total number of men in our medical school who are working on such problems, one-half have been through this particular mill. You cannot draw any certain conclusions from that. It may mean one of two things, or, perhaps, more. It may mean that certain men are influenced by this to go on into experimental work. Or it may be that they would go on anyway. The thing which is important, I think, is that it has been possible to pick a large proportion of capable men and to pick them out after a very short time in the classroom and do something for them. That, I think, has been a definite contribution.

One other point I would like to make with regard to the bearing of this experiment on instruction in physiology and, perhaps, in some of the other laboratory sciences. I have reduced the laboratory work by one-half. I have never had any student tell me that he felt he had lost anything by not doing more laboratory work. I am inclined to ask you to think over whether it may not be that we are intending to rely too much on the laboratory method in our elementary teaching.

It seems to me that like all material machines the laboratory course tends to get us in its grip. We get it organized, we get the outline printed, we get all the necessary pieces of apparatus, we get the stockroom boys trained and then the thing will run itself. I think that that kind of a machine gets a momentum which carries

us along and keeps us very frequently from thinking seriously about just exactly what each of these experiments really means for the education of the individual.

I am inclined to believe that if some of the money which we spend every year for student experimentation could be put into books which could be used over and over and over again, books of the sort I have referred to, books which we proudly refer our students to, knowing there is but one copy in the library, I think if we would put more money into that we would fare just as well.

DISCUSSION

DR. H. T. KARSNER, Western Reserve University: In thinking over this matter that has been brought to our attention in the past by Dr. Edsall and so clearly explained by Dr. Redfield, it occurs to me that perhaps the experiment may, because of limitation of funds and perhaps for other reasons, not have been applied in quite the breadth that might have been possible had conditions been different.

As Dr. Redfield expresses it, it seems to me to be a tutorial system, referable almost purely to the scientific work of the student and applied really to a limited number of students. Some of us are puzzled about the entire situation regarding tutorial work and some of us are in such a position that we cannot see our way clear to adapting the proposal to an entire school.

I thought it might be of interest to say that the principle can be adapted under distinctly different conditions in an individual department. In our school we have sixty students in the second year class and among the corps of instructors in the department of pathology, there are enough men so that the class can be divided into sections of ten and assigned to instructors, who are told that they are in a tutorial, and in a sense, a preceptorial relation to these students. This is over and above the fact that the school arranges what is called a faculty advisor for each class. The tutorial and preceptorial arrangements are such that the instructor has his group of ten students throughout a comparatively short course lasting only about six months, but the relations are such that these students feel, and from experience lasting now over three years we know this to be true, that he can appeal to the instructor who is his tutor for advice in matters concerning his personal welfare, his finances and other things that come up from time to time, in addition to his professional work.

I shall not burden you with details connected with this arrangement but I can say from an experience of three years that we have found it eminently satisfactory.

DR. B. M. RANDOLPH, George Washington University: Dr. Redfield brings out by repetition that it is hard to get at the student and I do not believe that all teachers can get at students by the same method. I do not believe that any teacher can get at all the students by the same method.

I have seen a great deal of teaching because I have spent most of my

life at it. I think some teachers are born that way. It seems to me the fundamental quality is a certain sort of intellectual sympathy which enables the man whom we describe as a born teacher to place himself in the student's position; in other words, to detach himself from his own habitual concept, mental and otherwise, of the subject he is teaching, and put himself in the student's place.

One of the best ways that I have found (my teaching is exclusively clinical) is free-for-all questions and answers, not only by the teacher asking the student, but by getting the student to ask of the teacher. They will be a little diffident at first but they will soon get to understand the game. It is useful both in general and bedside clinics. I believe in teaching them personally things that, perhaps, they would not read elsewhere.

There is one other thing I think is good. I may be rather individual in this, but I believe that the practice of students' taking notes on subjects ought to be discouraged. More mental effort is wasted in figuring out notes than is used in digesting what is heard. Their memories are spoiled and their power of analysis is absolutely suspended in the effort to transcribe notes.

Finally, I believe that if the principle of going back to basic science, i.e., the pathological concept in all problems that come up in the clinic is observed by the teacher, that this eternal discussion between the laboratory and clinical divisions will be reduced to an insignificant matter. Again, the question is not how much to teach the student, but how to teach him, and how much the student learns.

USE OF PATHOLOGICAL MUSEUM IN TEACHING MEDICINE AND SURGERY*

HOWARD T. KARSNER
Western Reserve University

The consideration of the purpose to be served by the pathological museum in teaching medicine and surgery might be enlarged so as to include all the clinical subjects, because the principles involved are the same throughout.

The history of the development of museums of pathology is comparatively brief in point of time. Giovanni Guglielmo Riva (1627-1677), a physician of Rome and physician to the Pope, not only founded the first society for pathological anatomy but also established the first museum of morbid anatomy. At that time,

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Italy unquestionably had an important influence on the development of scientific subjects elsewhere in Europe but as to how, in this particular feature, the work of Riva influenced the latter developments of which we know, is impossible to state. The great museums in English speaking countries were started about a century later. That of William Hunter (1718-1783) is still in existence in the University of Glasgow and that of John Hunter (1728-1793) at the Royal College of Surgeons in London. Although Matthew Baillie is to be regarded as the father of medical pathology in English speaking countries, his own museum was not very extensive and reposes at the present time in the basement of the Royal College of Physicians in London, where it is of little or no value to the medical world at large. In German speaking countries, museums on a rather limited scale seem to have been established first in the latter part of the 18th century. In the early part of the 19th century, probably the greatest museum was that built up in Vienna by Carl, Freiherr von Rokitansky (1804-1878). Rokitansky worked under difficult conditions and indeed built the museum in the hallways of the old Krankenhaus. It is said that he built his museum cases up to the level of the rather high windows in these hallways and then had to climb on top of the cases to make his preparations. At the present time there are numerous important collections in Germany, probably the outstanding one of which is that of Ludvig Pick at the Krankenhaus zu Freidreichshain in Berlin, a marvelous assembly of beautiful preparations. In Great Britain each hospital has a creditable museum, and in certain of the institutions, notably St. Bartholomew's Hospital and University College, these museums are extraordinary in the extent and variety of the preparations. It is true that on this continent most of the medical schools have useful museums but the outstanding collections seem to be those of McGill University and of the Medical School of Harvard University. Our pride, however, centers about the museum of the United States Army Medical Corps in Washington.

The future of the pathological museum seems to be well assured. Methods are published in a variety of journals, but one of the most useful, if not the most useful, is the *Bulletin of the International Association of Medical Museums,* published at irregular intervals, usually once a year, and filled with stimulating and valuable articles. The gradual increase in the number of autopsies in our various hospitals is a significant indication of the lively interest in pathological anatomy and of the probability of increasing the scope of the museum.

The material in the different collections is variously made up. There are dry preparations of tissues and organs, particularly bones. Wet preparations of organs are preserved according to different methods and not infrequently cleared so as to show vascular or other internal structures. Sections of organs are mounted, sometimes thick and opaque, sometimes thick and clear, or sometimes thin, either unstained or stained. Photographs, drawings, lantern slides, both gross and microscopic, are frequently to be found. The wax models also serve a useful purpose.

In the study of gross morbid anatomical material, it is of importance to know the relation of any special tissue or organ in the body to other organs. For a full comprehension of the character of the lesion it is necessary to know the size and weight, the consistency and texture, the color and odor, and the finer details of structure. In older days even the sense of taste was called into play but chemical analysis now substitutes the information formerly obtained in a way that does not appeal to the delicate sensibilities of the present generation of pathologists. The museum preparation may give one or several of the desired features but in no sense can it give all. Museum preparations therefore can be regarded as only a pictorial representation, in two or three dimensions, of the object studied. This fact, which bears no contradiction, should be steadfastly borne in mind in any scheme of teaching which involves the use of the museum.

The pathological museum, to attain its fullest value as a teaching collection, must have a record of the clinical features of the case. This is frequently attached to the label, or the label may become a large chart giving clinical features, photographs of patient and photomicrographs of the lesion concerned. On the other hand, this larger presentation may be filed, so as to be available for study in connection with the specimen.

The expense involved in building up a museum, aside from the cost of space, museum cases and other equipment, is a feature that is often not properly considered in the apportionment of budgets of medical schools. If the museum is to be utilized by the clinical teachers, as will be the case when an excellent collection is established, it becomes the duty of the whole school group to see that the budget is so apportioned that the museum can be adequately supported. It seems unlikely that a museum for a good medical school can be managed for less than $5000 annually. Probably a great deal more is needed, depending on how great the interest of the staff happens to be and how essential it is to employ curators and technicians.

In a certain sense, the museum is a library of pathological anatomy. The preparations should be available for study, as books are in the library. New acquisitions may be given a place of prominence. Specimens may be examined in the museum or loaned for study and exhibition elsewhere. As a central library serves a clientele of interested persons, so should the museum. As the library sustains losses in proportion to the freedom with which it is used, so must the museum. In more concrete form of expression, the teachers may bring or send their students to the museum or specimens may be loaned for demonstration in the clinics.

In clinical medicine or surgery, where the objective method of teaching is employed, it is customary to bring before the student, or bring the student to, the living patient. It is considered unwise to attempt to teach these clinical subjects either entirely or largely through the medium of printed records of the case. It may be said that this is necessary because clinical medicine studies both form and function. If, however, that be true of clinical teaching, it should apply equally to the basic subject of medicine, namely pathology. Whilst pathology deals largely with alterations of form, nevertheless, it must also consider the associated alterations of function. Any method of teaching clinical subjects is equally applicable to pathology.

The use of textbooks and groups of case records to amplify the study of living patients, undoubtedly of value, is to be regarded as a compromise between the purely objective and subjective method of instruction. The use of the museum specimen is also a compromise between the use of the fresh preparation and the use only of word descriptions or two dimensional pictures.

There can be no doubt that the pathological museum so arranged as to be readily available for the use of the clinical teacher has its place in the scheme of medical education. Ideally, the use of fresh preparations should furnish the anatomical basis for clinical and pathological studies. Admittedly, this is not practicable because of the fact that the type of fresh material available does not often coincide with the clinical cases to be illustrated. The museum must be sufficiently extensive to provide representative lesions of most, if not all, the clinical conditions which must be illustrated. If there be a coincidence of fresh material and living patient, the opportunity to correlate should be utilized. Otherwise, the museum is to be called upon. The teacher, however, must not fail to realize that the museum preparation is little more than a three dimensional picture of the lesion under study and demonstrate it accordingly. It is to

be recommended that every medical school devote a goodly amount of attention to building up a freely accessible and reasonably extensive pathological museum, but this should be done with a realization of the limitations of this type of material.

DISCUSSION

DR. E. S. RYERSON, University of Toronto: I would like to emphasize what Dr. Karsner has said and make a strong plea for a greater use of pathological museums in teaching. As the result of holding a dual position in pathology and surgery for a period of five years, I had a very close contact with these two subjects. Since then I have continued to teach clinical surgery and I would like to describe my attitude on this aspect of teaching. My experience may be helpful to others in the use of pathological museums in teaching surgery or the other clinical branches.

The objective in making a diagnosis of a case in the ward is to determine from the history, the physical signs and the results of the laboratory tests, just what the pathological process is, which is going on in the patient. I endeavor to teach the student to interpret the signs and symptoms in such a way that he will be able to visualize the process within the patient. Instead of merely allowing the student to see a patient lying in bed with gallbladder disease, he can be taken to the pathological museum and shown a series of gallbladders, from which can be selected the one which it is considered most closely resembles that which would be found in this patient on the operating table. Only occasionally is it possible for arrangements to be made, so that all students who have had clinics on such a case in the ward, may watch the operation performed and see the nature of the pathological changes in the gallbladder. By going to the pathological museum the student gets an opportunity to relate the signs and symptoms to the pathological process.

Museum specimens can be used in another manner. A series of pathological specimens are shown to a group of students either in the museum or in the hospital ward. The following illustration will explain another method of using them for teaching purposes. The student is shown a particular specimen and asked "What would you think the history would have been in this case?" "From what symptoms would this patient have suffered?" "What physical signs would have been present on examination?"

In one instance I showed a class a small contracted bladder and asked them what symptoms the patient would have had. After going through a class of six or eight students not one pointed out the fact that there would have been frequent micturition. It is surprising how a class could overlook an important fact of that kind and not realize that the cause of the frequency was the fact that the bladder would only contain one or two ounces of urine. The museum can be used in either one or the other way and as a result of using the museum first one way and then the other the student gets a dovetailing of the clinical with the pathological and acquires a real understanding of the relationship of the pathological process in the patient

to the clinical picture. He is thus aided in gaining a medical education instead of merely memorizing certain facts.

Dr. D. J. Davis, University of Illinois: I would like to ask Dr. Karsner what he considers a reasonable working museum in a medical school at the present time? I presume it is true that the importance of the museum is decreasing and one of the reasons, no doubt, is the fact that we are having very much more fresh material to use in teaching. There is also less use of pathological specimens for research purposes than in years gone by. I think Dr. Karsner is right in pointing out that pathological museum material has a greater value to the clinician than to the pathological department because of the fact that now in pathology we have usually so much fresh material. We have found, however, the use of pathological museum material of very great value in presenting summarizing courses in pathology, particularly in the latter part of the medical curriculum.

Dr. Louis B. Wilson, Mayo Foundation: I should like to say a word concerning the museum as a factor in research. About thirty years ago I began the investigation of museums with this end in view. After about eight years' experience and study, I came to the opportunity of developing a museum for this particular purpose. After twenty-two years we now have, in Rochester, a pretty good research museum. It contains about 300,000 specimens. They are accurately card indexed and each one is quickly available. They are also accurately correlated with the clinical histories. This makes a fund of material for research, which is of incomparable value to our graduate students and it is being used constantly. More than 200 men are working in fields in which a study of pathological problems is of value to them and a considerable amount of their time is used in studying pathological museum material. In recent years we have been developing also the small group exhibition museum. It seems to me this is one of the most valuable resources we have for teaching clinical medicine and surgery.

Dr. J. W. Jobling, Columbia University College of Physicians and Surgeons: I agree with Dr. Karsner that fresh necropsy material is more valuable than museum specimens for teaching general pathology, though, of course, the latter must at times be used. However, as we in general pathology are coming to place more and more reliance on fresh necropsy material for our teaching, the clinicians are making increasing demands on the museum for this purpose. This brings certain complications, for this increased interest means that more specimens are sent to the museum, and while some of these are well worth keeping, others are not. Who is to pass on the value of such preparations? In addition, the present cost of glassware makes the expense of building up a modern museum almost prohibitive, if the money is to come from our regular budgets.

I am convinced that a museum cannot function as it should unless it is under the control of a man whose entire time and interest can be devoted to the work. With this idea in mind, I have suggested that we create in the department of pathology at Columbia University, a subdepartment which will have charge of the museum and art work of the school. This new depart-

ment will be directed by a trained curator who will choose his own assistants and have his own budget.

DR. H. T. KARSNER: Certain fundamental principles are involved in the questions raised in this discussion. These center about the teaching of pathological morphology whether by pathologists or clinicians. The pathologist must decide whether he is to use fresh material or fixed material and whether his course shall be systematic or unsystematic. We start with the assumption that the fresh specimen is of much greater teaching value than the preserved specimen. We take the British attitude that pathology is a clinical rather than a preclinical subject. In the clinics it is necessary to use patients for teaching purposes as they become available, with the consequence that the courses are somewhat unsystematic.

Fresh specimens are available as necropsies are performed. If such speciments are of superior value and if pathology be regarded as clinical in character, it is logical to take up the work in gross morbid anatomy in courses which do not follow a foreordained routine.

I agree with Dr. Jobling that the expense of a museum should be shared by those who use it. It is of great value in clinical teaching and in those departments of pathology that do not command a large amount of fresh material. In case there is a wealth of fresh material, the department of pathology has little need for the museum and should consequently bear little of the cost. Since, however, the material for the museum becomes accessible through the pathology department, it would be advisable to have the museum under the supervision of that department.

There can be no serious exception taken to the point raised by Dr. Wilson that the museum can be used for investigative purposes. Nevertheless, the best examination of gross material, whether for investigative or other purposes, is made when it is in the fresh state.

The scope of the museum must depend on the material and the funds available. The attempt should be made so to build the collection that representative lesion can be demonstrated. Subsequently, the less common conditions can be added as circumstances permit.

STUDENT ASSISTANTS IN MEDICAL COURSES*

A. P. MATHEWS
University of Cincinnati College of Medicine

I have very little to say on this subject. When I came here I came empty. It seemed to me there was only one thing to be said and that would take about two seconds to say. That was, that there should be no student assistants.

*Round Table Conference: Thirty-seventh Annual Meeting, Cleveland, Oct. 26, 1926.

I had the good fortune, however, to set opposite a gentleman at lunch who undertook to fill up this condition of vacuosity, not knowing its extent. He maintained that there was an important question about student assistants. He said that there were some schools so poor that they could not provide proper assistants and would have to make use of student assistants. In addition he maintained that there was some difficulty in obtaining teachers in the fundamental branches, in anatomy particularly, and it was his idea that through the student assistant the future anatomists might be trained.

Besides those points he made some other points which I cannot give you at this time, as the pressure in the vacuum is not sufficiently great. I asked him why the medical school was in such a condition of poverty and why this condition occurred particularly in the medical schools of the universities. He answered: "Ah! That is the question", and so I have not any answer to that question.

It is indeed, a question requiring an answer because the medical school is not distinct from the university. The problems before the medical schools are not different from those in other schools of the university. I can only state in this regard my own experience, which is, that student assistants are extremely unsatisfactory; that while the assistant may get something himself out of his experience as an assistant it is hardly fair to the other students to employ him. He usually makes a very poor instructor. If you use him to prepare solutions and do things of that sort, he is poorly trained for it, and he does it only at odd moments and very inefficiently. The university, in other words, gets very little for its money. If the student assistant profits, he should pay the university.

I have given up student assistants. I think the university that employs them is getting very little for the money they put into them. My suggestion is that others do as has been done at Cincinnati in my own department, and give me the money which a student would have earned by getting his tuition for that service to the department. In that way I can get a graduate student, not a student of medicine, but a real student, a student of science who wishes to learn the science of biochemistry. The time of a graduate student is not entirely engaged in set courses. He does not have any desire to practice and he is able to give the proper assistance for which he is paid and he proves to be very much more satisfactory to me. Moreover, he will make a real scientist and remain in the profession of teaching and research, which is not true of the medical student, except very rarely.

DISCUSSION

DR. C. R. BARDEEN, University of Wisconsin: My own experience has been exactly the opposite of Professor Mathews'. We have had student assistants in anatomy and other departments for years. The particular value of the student assistant lies in the aid which he gives in developing the type of instruction Dr. Miner talked about.

In making use of the student assistant in the department of anatomy, we have weekly conferences in which the older members of the staff and the student assistants take part. Here teaching methods and similar questions are discussed. We find that the students who are studying anatomy often feel more at home in debating questions that come up in the course of their study with a student assistant, more than they do with an older instructor. They are sometimes a little bit bashful about disputing the word of an older instructor, but they are quite willing to discuss freely their problems with the student assistant.

My experience has been with student assistants who have been required to take more time than the other students to finish the medical work. The work they do is not merely crowded into an over-crowded curriculum. The student profits very much from acting as a student assistant, since one often learns most when he tries to teach. I would not like to see student assistants given up at Wisconsin.

DR. B. D. MYERS, Indiana University School of Medicine: I want to say a word for the student assistant. I do not believe that it is a makeshift affair; the reason for employing a student as assistant is an economic one. I can understand that the need or the advantage of the student assistant would vary in different departments, but the department of gross anatomy, I am certain, could use the student assistant to advantage. By student assistant I presume a man who has covered the ground in gross anatomy and is spending an extra year, perhaps, taking a baccalaureate or advanced degree. That man comes into the class and is used in this way. He does not pose before the class, nor do we permit him to pose before the class, as one infallible in his subject. We use him as a sort of quiz master. I believe that some of the best gross anatomy teaching is done when the student makes a demonstration of his dissection before a small group. If you have 100 students, you can not very well take full time, or even have assistant professors taking full time to make demonstrations that cover perhaps an hour or an hour and a quarter, but with a small group of two or a maximum of four, you can cover your class with perhaps four or five demonstrations on each dissection.

Here is a man who has not only the subject matter to get but he has to get the vocabulary in which he expresses or discusses the subject matter. He has a double load, and he never has the subject matter quite as well as when he has expressed himself in a demonstration.

He can be a pretty good text or armchair anatomist in another way. I had such a fellow about a couple of years ago. I was giving him a little quiz and I picked up a section of a kidney and put it under a microscope. He saw the section and knew it was a kidney. I examined it under low power

and I saw the textbook picture of it. Then I put it under the high power and you could see only the renal artery, which filled up the whole field and nothing else. I said to him, "look down into the microscope and tell me what you see". He gave as lovely a description of a kidney as you ever heard, when all he could see was the renal artery.

There is too much of a tendency toward that sort of thing. They come through the different departments, and as our Kentucky friends say, "they learn what they can." In experiments what they learn is not so much good, that is, what they learn out of the textbook. The only stuff that is really worthwhile is the stuff they can recognize when they actually come to the living patient. I believe some of the best work that has been done in my department has been accomplished by the use of the student assistant in the drill which it gives a man in expressing himself and in the use of anatomical terminology.

DR. E. J. CAREY, Marquette University: I wish to express myself in the same vein as Dr. Myers and Dr. Bardeen have expressed themselves. How shall we train men in the fundamental sciences unless sometime in their career they have been student assistants? I would like to ask Dr. Mathews what his definition of a student assistant would be.

DR. A. P. MATHEWS: The points that have been brought out show that being a student assistant is a great advantage to the student. But, they have not brought out any advantage to the student who is being put through the class in which a student is assisting, nor any advantage to the instructor, nor any advantage to the university employing him. I did not doubt the value of instructing to the student assistant in training him, but if he is going to be a real scholar, if he is really going to be worthy of a post in anatomy or in biochemistry or physiology, he must know his science, and that takes a long time to learn. I would rather have a man who is interested in that primarily than a so-called student assistant.

I do not know that I would care to define the student assistant. I could not do it any better than it has been done. We all mean one who is really interested in knowing for its own sake and not for what he may get out of it.

PROBLEMS OF THE BACTERIOLOGIST IN HIS RELATIONS TO MEDICINE AND THE PUBLIC HEALTH*

HANS ZINSSER
Harvard University Medical School

When one is confronted with the rare—shall I say—opportunity of writing a presidential address, the temptation is great to try one's wings at oratory. However, while bacteriologists, occasionally born,

*Presidential address delivered before the Society of American Bacteriologists, 1926, and reprinted from the *Journal of Bacteriology*, March, 1927.

can be made in a fairly successful manner for public consumption, orators are always born. It seemed better, therefore, in seeking honorable solution of a task like the one before me this evening to suppress the impulse to deliver an oration and instead of this to talk; and, moreover, to talk as simply as I can about matters that have long been in my mind, instead of painfully seeking for a subject for the kind of presidential address which my conscience tells me I ought to deliver.

The subjects that I have chosen for my discourse are therefore to some extent disconnected, but in my desire to say things that have seemed to me important I have ventured to sacrifice form to content. Many of the opinions that I am about to express, especially in the third section in which I deal with the patenting of scientific discoveries, are sure to provoke adverse criticism. However, they represent seriously considered opinions which I have felt are entitled to consideration by a group like the one represented by this Society. If I arouse opposition in many of you and approval in a few of you, I shall at least know that my breath in passing the vocal cords has gathered words that will reach you as something more than forcible expiration.

I. ON A GROWING MISUNDERSTANDING BETWEEN THE MEDICAL PROFESSION AND THE SCHOOLS IN REGARD TO THE TEACHING OF THE SCIENCES

Every progressive movement creates its own reactionary response. This is wholesome and keeps the wheels of progress in the middle of the road. As a rule, however, in most human affairs the reactionary party is that of the old and skeptical who are applying the brakes because they fear a disturbance of those conditions which have given them their own successes and privileges. When this is so it is normal and a well recognized phenomenon which can be left for solution to time and mortality. In medical education at the present time, unfortunately, this general rule does not hold. It would be convenient and reassuring to dismiss the criticism and objections that are made in regard to the conduct of our medical schools as the grumblings of old fogeys. But this would neither be true to the facts nor would it serve to clarify a misunderstanding which is not without grave dangers to the healthy development of medical progress. For it is well to remember that however firmly established these medical schools may be in their university connections, they should—indeed must—have the sympathy and support of the profession at large. For the progress of medicine will con-

tinue to be so rapid that—to serve the public and uphold standards —there must be maintained a continuity of cooperation between the educational products of successive decades by which the developments of knowledge may be constantly fed, in the form of the younger graduates, to the central stream of medical activity, where ripened clinical experience will apply them to the problems of practice.

There is threatening to develop a gap in this continuity at the present time. The bitter critics of the medical schools are not the old, the intellectually lame and the halt. The most serious protests against the policy of extensive—and therefore prolonged and expensive—scientific training are coming from active practitioners, some of the most successful in their respective fields and, therefore, eminently entitled to notice. If we exclude all the trivial, thoughtless and facetious disapproval which every rapidly progressive movement must encounter, there still remains a formidable and growing protest of dissenting voices from substantial sources. These are being expressed in important lay and medical publications and in addresses before medical societies, to say nothing of innumerable conversational comments wherever practicing physicians and medical teachers meet for discussion. The series on "Education and Service" published in the *Journal of the American Medical Association* by Dr. Wm. A. Pusey, the presidential address to this Association by Dr. Wendell Phillips are fair examples of the importance of the criticisms to which we refer. They are all of them earnestly intended, thoughtfully expressed and based upon apprehension caused by a number of obvious failures of the present system to meet requirements.

The basis of such criticisms has been most clearly presented by Pusey, whose articles are admirable in flatly formulating the issues. "We are producing only a very costly sort of physician," he states, "and are not now producing men to do the ordinary service of medicine for ordinary people." He reiterates the well-known facts that modern graduates will not go to the country, that the family physician is disappearing and leaving an open field for the quack, the midwife and the faddist. These and many other evils he lays at the door of the medical schools. Students are crammed full of useless facts, he asserts, and if teaching methods were not quite as inefficient as he believes them to be, entrance requirements could be curtailed, and the courses shortened to three years without loss, possibly gain, in the quality of the product. He accuses the schools of emphasizing research at the expense of teaching, and states that

"research and education are not the same things." We might with profit quote much more extensively from Dr. Pusey's article, for he voices clearly and unashamed the views of those who hold faulty educational methods almost solely responsible for present failures in medical service. For our present purposes we must overlook the obvious contributory importance of other factors such as economic pressure, social readjustments and the growing necessity of equipment, cooperation and specialized advice for the adequate modern medical service to which even "ordinary people" are entitled, and may confine ourselves entirely to a consideration of the alleged errors in methods of instruction.

Those who are responsible for the conduct of the schools are fully aware of the defects which he points out. The ultimate purposes of adequate medical service for which Dr. Pusey strives are also those of the teaching institutions. The difficulties to which he gives too little consideration are those created by the prodigious volume of scientific knowledge contributed to the field of medicine in a relatively short time; and it would seem obvious that increased requirements for knowledge and technical ability can not be satisfied by shorter periods of training and neglect of instruction in fundamental principles.

Let us consider for a moment what eminent clinicians expect of the modern graduate in medicine. We repeat a quotation used by Dr. Wendell C. Phillips from an article by Dr. Billings: "The ideal general practitioner 'must have a good knowledge of general and physiologic chemistry, of human anatomy and physiology, of pharmacology, of general pathology,—with constant training, through the four years of residence in morbid anatomy,—of epidemiology, immunology and psychology. In the clinical branches he must have the training of his brain, special senses and hands in the recognition of disease. He must learn to use the simple diagnostic aids in the form of instruments and laboratory tests. With this knowledge of the methods of diagnosis, he must have constant and daily opportunity to study disease as expressed in the ambulatory and ward patients. He must have an opportunity to observe the etiologic relations of occupations, environment, social conditions and other factors to disease. He must learn and recognize the importance of community as well as individual disease' . . . ," etc. "Superman" is the thought that comes to the mind on reading this. Of course it cannot be accomplished—but if it can be approached at all, it is quite clear that the curtailed curriculum is not a promising method.

It may be admitted that, with constantly growing accumulations of fact and too slow a transformation of older methods, there has been a period of over-teaching which is still to some extent upon us. But in facing a task difficult beyond precedent in the educational field, experienced medical teachers are aiming, not at the immediate and temporary solution of the present transitional difficulties, but at an eventual provision of men capable of—as Stockard puts it—"understanding and applying scientific biologic knowledge."

Medicine is not a trade that can be drilled into an unprepared mind by shop methods. While it is not entirely a science, there is much reason for believing that a thorough comprehension of the chemical and biological principles underlying the pathology and therapy of the diseases met in daily practice are absolutely indispensable to the later acquisition of the equally important technique or art of practice. Is it conceivable that even today a practicing physician can intelligently apply modern therapeutic methods to cases of diabetes, nephritis or any of the other metabolic diseases without at least a fundamental training in organic and biologic chemistry? Is it desirable that he employ the various agencies of specific diagnosis and therapy like parlor tricks or patent medicines, without understanding the principles by which their use is rendered logical? Moreover, medicine is moving forward, and the student of today will be in practice twenty and thirty years from now. Is there the slightest hope that he may be able to follow in the footsteps of advancing knowledge unless a considerable part of the short years of learning is given to the fundamental soil from which this new knowledge will grow? What hope would there be for our chemical industry, if students were apprenticed in factories without knowledge or experience of physical or chemical reactions? What of the future of our engineers, if they were taught with formulated tabulations instead of being drilled in mathematics? The scaffoldings of medicine are and will be constructed from biological, chemical and physical principles. If these are reasonably understood, available knowledge can be utilized; and the progress of the future can be mastered. Without such training the graduate is left suspended in midair instead of standing on a ladder which he can climb. He is like a musician who has learned a few pieces without reading notes; and the difference between him and an intelligent midwife ten years hence will be not much more than that between Dr. Slop and Susannah, who assisted at the birth of Tristram Shandy. Dr. Pusey says: "The resourceful man has his equipment under his hat and in his hand, and he gets it, not in the laboratory, but in clinical experience." We may grant a considerable hat, but not even the hat of the late

Houdini—while it might be made to disgorge amboceptor rabbits and guinea pigs—can be relied upon for Wassermann equipments, electro-cardigrams, potentiometers or metabolism laboratories.

It is true that methods of teaching have become experimental rather than didactic, but this is in the interests of stimulating the students to draw conclusions rather than feeding them on dogmatic statements. That errors are made and pedagogic principles transgressed, no one will deny—but the effort is there; and the suspicion of attempts to make investigators of students is quite obviously refuted by the intrinsic impossibility of such an endeavor.

Let it be granted that the graduate from a medical school today is not a finished practitioner. Let us even concede that he is not as capable of taking charge in the sickroom on the day of graduation as his predecessors of the last generation. All this is true, but the fault lies in the growth of medicine; the remedy lies, not in the schools, but in the hospital years and in the tutelage of his elders in the field. The situation cannot be met by aiming our educational methods at the rapid production of "cheap doctors for the country" —a sort of "Muzhik" doctor, or "Feldscher"—justified in a democratic country only by the possibility that the farmers are a tougher breed, but otherwise untenable.

We should suggest that the critics of the medical schools have patience with those attempting to perform a difficult service; that they come to the schools as observers; that they attend clinics by some of their full-time colleagues and examine whether there is not something here, different from that which is given later by the practicing clinicians, and not more valuable perhaps, but equally essential to the full development of a modern physician. For the physician of the future will be a different person from the physician of the past. He will be no finer than the Oslers, Delafields, Jacobis, James', Shattucks and others who inspired our youthful ambitions. But to be equally fine and capable of meeting the responsibilities which accumulating knowledge is laying upon his shoulders, he must needs be differently trained. For in medicine, more than in other professions, ignorance—usually a negative failing—becomes a positive one; and a physician who neglects, through lack of knowledge, to apply available methods of interference may be as morally guilty as though he had hit his patient on the head with a hammer.

As to the eventual adequate supply of men willing to submit to this rigid discipline for relatively modest material futures—may we not safely trust to that consoling human folly that has made Christianity a reasonably successful institution?

II. ON THE INTERDEPENDENCE OF RESEARCH AND TEACHING

A considerable part of the criticism aimed at the modern medical school boils down to the charge that too much emphasis is placed upon research, and too little attention given to the teaching of existing knowledge. Defense against this accusation involves a general discussion of the functions of the departments which instruct in the preclinical sciences, and calls for some consideration of the assertion—frequently coupled with such criticism—that "research and education are not the same things" and had better be separated. This last suggestion, we believe, is a pernicious one chiefly because it fails to recognize the importance of a high order of scientific background for that most difficult of all teaching, the exposition of the simple, basic facts to beginners—a task that is incompletely performed unless the information conveyed arouses curiosity and awakens the critical faculties.

If the scientific laboratories of medical schools were to be planned to serve purely teaching functions, they could be organized cheaply and simply; but, though it sounds a paradox, such limitations would defeat their very teaching purposes. We are admitting, of course, that medical students cannot be graduated as investigators, and it is surprising that anyone should assume that otherwise reasonable educators are not aware of this. But we assert that the separation of investigative activities from departments engaged in the exposition of any subject in medicine would irreparably damage their purely educational effectiveness. Men who devote themselves exclusively to the teaching of subjects as actively advancing as are the various departments of medical knowledge, with little or no interest in investigation, show themselves by this testimony inadequately endowed with intelligent curiosity and imagination. They are manifestly pedants whose faculties are left unstirred by the most fascinating invitation to intellectual adventure that modern thought has to offer. The teacher of a growing science who abstains from inquiry is as much out of place in a laboratory as a prohibitionist in a wine cellar. Moreover, to teach adequately and inspiringly signifies not the dispensing of other men's thoughts but, rather, the distillation of accumulated knowledge through the mind of the expositor, carrying over a part of himself in the process.

Over-emphasis on mere pedagogy in the teaching of a science—a real danger, if recent critics are given their heads—may easily do to medicine what it has done, in our own experience, to science courses in some of our teachers colleges. In at least one institution

known to us the university chemical department did not, a few years ago, accept as equivalents courses given on the same subjects to students in its own teachers college. These things are not cited in order to belittle the desirability of developing better methods of instruction in the sciences. They are mentioned in support of the view that the best and most inspiring teachers—those whose spirits have catalyzed the latent capacities of their students, and have transmitted to them something more than forgettable facts, are the investigators whose teachings have been interwoven with that joy of their work that is born of the spirit of exploration. We may paraphrase the remark attributed to Sir Thomas Lipton that "married men make the worst husbands" with the truism that the professional pedagog makes a poor teacher of science. He will teach—by a perfect technique, perhaps—the things he has read in a printed book, or the things that he has been told and shown, but his teachings will be as uninspiring to his students as Tomlinson's sins were to the devil in Kipling's poem.

Incidentally, in spite of the encouragingly generous recognition by the universities of the truth of these principles, it is growing annually more difficult for the scientific laboratories generally to recruit the most promising young men for their important tasks. Competitive opportunities in the clinics, in research institutes and in the industries, with better pay and less routine, are luring many of them away. And in this alone there is a sufficient element of danger, without added discouragement from those who would reduce these teaching departments to the status of the Mohammedan schools where the scholars study the philosophy of the Koran by chanting it in unison. It might mean that, gradually, intellectual leadership in fundamental investigation would drift away from the universities—and if this should go far enough, these institutions, upon which, after all, the intellectual development of the future depends, would cease to be truly universities and become mere teaching high schools, without inspiration and without hope.

Let us admit that there are rare and precious spirits with a genius for investigation who have no talents or desires for teaching and who, in the interests of husbanding our gifts, should be protected from the interruptions of the class-room. It is an obvious waste for men of the Loeb and Theobald Smith type to be burdened by routine, be it ever so limited. These, however, are a small minority for whom exceptional provision is justified and—as a matter of fact—provided. But, fortunately, men with excellent teaching ability have often been capable of considerable originality in re-

search; and many others with investigative talents of no mean order have, not exceptionally, possessed sufficient ability to expound; and any defects in pedagogic technique have been amply compensated for by the enthusiasm they have conveyed to their students. We need go no farther back than the present generation to illustrate the contention that those teachers who have most influenced medical students and whose spirit is most alive among the younger practitioners of our country today, were men actively and productively engaged in investigation. Would a system of separation of these two functions have developed Welch, or Remsen, or Edmund B. Wilson, or Chittenden, or Halstead, or Henderson, or Huntington, or Lusk, or Abel, or Folin, or a host of others whose pupils are shaping the destinies of American medicine today?

It is too often assumed that originality and scholarship are incompatible with common sense. But the professor and scientist who holds an egg in his hand while he times the boiling of his watch, or who looks under the dresser for a collar button that is in his shirt, is more frequent in the humorous weeklies than in real life. It is quite safe to have confidence that those who are studying the problem as a whole realize that medical students must be given primarily the information which will prepare them for the duties of their profession. But they believe that such instruction cannot safely be limited to a recital of facts. They believe—or, at any rate, a great many of them do—that science and the student are best served in establishments in which every student may have opportunities for contact with men engaged in active investigation; and in which no instructor shall be entirely removed from the stimulating association with the eager and intelligent young minds that demand reason and proof as well as dogma from their teachers. Scope and the selection of material, and not the limitation of intelligent curiosity, are the real problems; and though, undoubtedly, many mistakes are being made and the pendulum has perhaps often swung too far toward irrelevant details—these are natural reactions against the dull lecture systems of other days.

The problem—and we do not claim that it has been solved—lies perhaps in a closer coordination of the laboratory teaching with its clinical applications. But whatever the solution may be—and it is being earnestly sought—it surely will not be found in a sterilization of the teaching force, which indeed more often needs a Voronoff than a general surgeon.

Let us be thankful that the medical schools are so closely allied to universities, so strongly influenced by the fundamental departments of physics, chemistry and biology, and that university authori-

ties are recognizing the important principles that true education signifies the planting of seeds in fertile soil, and not the feeding of the ripened fruit of the past season.

THE OUTPATIENT CLINIC AND THE PROBLEM OF INSTRUCTION IN CLINICAL MEDICINE*

GEORGE E. SHAMBAUGH
Rush Medical College (University of Chicago)

Outpatient dispensary work in this country has in many respects not kept abreast with the development in hospital work. Too often the outpatient clinic has been allowed to carry on in surroundings and with an equipment which, at best, is but a very poor makeshift, and which would not be tolerated in the hospital. The organization of the work in the outpatient clinic often lacks important factors that make for efficiency in hospital work. Above all else, the work in the outpatient clinic suffers in comparison with work in the hospital because of its inadequate medical personnel. As long as the practice is permitted to continue whereby those who take the responsibility of caring for the work in the outpatient clinic are not permitted the privilege of following the care of the patients who are referred to the hospital, we can hardly expect to retain, for any length of time, the loyalty and enthusiasm of the dispensary staff, for it is palpably unfair to deprive the men who are doing the routine dispensary work of the opportunity of following the treatment of the more interesting and more instructive cases when they are referred to the hospital.

There is another factor in the organization of dispensary work which has been responsible for the poor showing in dispensary practice as compared with hospital practice. This is the failure to develop a corps of graduate student assistants to take the place in the outpatient clinic that hospital interns take in the scheme of hospital work. It is in regard to this deficiency in the organization of dispensaries and its remedy that I desire particularly to speak.

There exists in this country an increasing demand for graduate training in clinical medicine from men who desire preparation for entering the practice of one of the specialties. This includes as well those who aim to restrict their work to general surgery and internal

*Read at the Twenty-second Annual Congress on Medical Education, Licensure and Hospitals, Chicago, Feb. 14, 1927.

medicine. There has been evolved as yet no adequate plan whereby such men are able to secure proper training. The undergraduate medical curriculum and the hospital intern year are properly interested solely in preparing men for general practice. This problem of preparing men for special practice is one for graduate instruction, and with the rapidly increasing tendency toward restricting practice to special fields may properly be considered the outstanding problem in medical education today. It is as much a problem for the university as is undergraduate medical training. The graduate in clinical medicine seeking preparation for special practice needs as much as does the undergraduate medical student the inspiration of university ideals and the university spirit of research.

Departments of clinical medicine working under the auspices of universities should be expected to meet the obligation which an affiliation with the university puts upon them of making work in their departments conform, in general, with the ideals underlying the work in other departments of the university. A conspicuous feature of university teaching, which distinguishes this from college work, is facility for doing graduate work and the opportunity to carry on research. A department of clinical medicine demonstrates its right to be recognized as a bona fide department of the university when it develops its work in such a manner as to attract graduate students seeking advanced work, including those who are preparing for practice in special fields, and develops in these students the spirit of research and provides training for investigation. The physician who takes an interest in the problems of medical education should find a much greater interest in assisting in this work of preparing men for special practice than could come from participating in the more elementary work of teaching undergraduate medical students.

What has this problem in medical education, the problem of graduate instruction in clinical medicine, to do with the question of improving the service in the outpatient clinic? The outpatient clinic is the place where most of the problems in clinical medicine are first encountered. It is, therefore, the one place where advanced clinical training for the first or fundamental year in preparation for special practice can best be provided. The key to proper clinical instruction in any special field is to make the student an actual clinical assistant who shares, so far as his training and abilities permit, in the responsibility of the work of the department. It is essential for the development of efficient service in the outpatient clinic that it be provided with a suitable corps of graduate students serving as clinical assistants comparable to the services of interns in the hospital.

The first problem in any clinical department of medicine is that of providing the best possible care for the patient. If this principle is lost sight of in an effort to give instruction, that department ceases to be a proper place for medical teaching. Graduate students taken into a department as clinical assistants must be an actual asset for accomplishing the work. This is just as important from the standpoint of medical teaching as it is for the carrying on of the work of the department, if we expect an interest in giving graduate clinical instruction to outlive a temporary enthusiasm for doing this work.

A clinical department of medicine will succeed in providing efficient graduate training only by concentrating its attention on developing the most efficient service for the patient. Ideal service for a patient spells ideal clinical training for the graduate student who participates in providing this service. Naturally, the carrying out of such a program means that the outpatient clinic must be housed properly and provided with an equipment that represents as near as possible an ideal equipment. The staff for directing the work should include men imbued with the spirit of investigation in order that they may instill this spirit in the graduate students and help them to pursue by the methods of research the clinical problems that are constantly presenting.

Perhaps, this thesis on the relation between the outpatient clinic and the problem of graduate instruction in clinical medicine will be made more clear if I relate briefly our own experiences in the outpatient clinic at Rush Medical College. Dissatisfied with the sort of services rendered the patient in the Department of Otolaryngology, we set out, seven years ago, to rehabilitate this work. First, we provided an equipment which we aimed to make an nearly as possible an ideal equipment for doing the work. Next, we worked out an arrangement whereby those patients requiring hospital care could be admitted to the Presbyterian Hospital, and provided a plan whereby their hospital treatment was followed up by the same men who were taking care of them in the dispensary. With these matters in order, we set about to solve our most difficult problem, namely, that of securing an efficient corps of medical men to provide proper care of the patients. For years our staff had found itself swamped with the details of work which it was never able properly to care for. Efforts to better this situation by increasing the staff has always proved ineffectual. Men would come to us with the best of promises, remain just long enough to acquire a smattering of technic for a few operations, and then withdraw to take up the practice of the specialty.

We decided to solve our problem of providing better service for the patient by making the outpatient clinic a desirable place for graduate students. This we aimed to do by so supervising and directing the work as to make this a valuable center for obtaining clinical training in otolaryngology. At the same time, we worked out the details of a program whereby the graduate students during the half of each day not spent in the outpatient clinic are at work in the laboratories of the University of Chicago completing their knowledge of the fundamental sciences, for work of this sort occupies as important a rôle in graduate training as it does in undergraduate medical study. In preparing for the practice of otolaryngology we concentrate upon acquiring a more complete knowledge especially of gross and microscopic anatomy of the complicated structures about the nose and paranasal sinuses, middle and internal ear, and upon acquiring first-hand information of pathology, especially that dealing with the internal ear.

We require of these men a minimum of one year's full time service. When we began this work we took on two graduate students, one coming on every six months. The next year we took on four, a new man coming in each quarter, and arranged the dispensary work so that there were four progressive periods of work which each student covered. During the first three quarters, their chief problem was to acquire skill in making examinations, learning how to evaluate their findings and in acquiring a proper appreciation of the indications for medical and surgical treatment. This training is always the big problem in preparing men for special practice. Only after the third quarter were the men allowed to participate in the work in the operating room for we stuck to the principle that it was improper to teach men how to operate who had not acquired an appreciation of the indications for operations. We felt that it was disregard of this principle that has been responsible in a large measure for the flood of indiscriminate nose and throat operations throughout the country.

We were guided in deciding the number of assistants by the requirements of the clinic, taking on only that number of graduate students necessary to provide the best possible care for the patient. The second year we employed four full time assistants; the third year we doubled this number, taking on two each quarter, and last year we found it necessary to increase the number to twelve, that is, taking on three each quarter. These men stay with us one year and are in addition to our permanent staff who direct and supervise the work. Our effort to rehabilitate the work in the outpatient clinic has had several striking results.

In the first place, for the first time since I have been connected with the dispensary, more than thirty years, we now find the patients receiving something like adequate attention.

In the second place, the permanent staff are finding their work in the dispensary more interesting than ever before. The graduate students, by relieving them of the many details which make for efficiency and which the permanent staff had never been able to care for properly, have made it possible for these members of the staff to devote more time to the study of those unusual cases which are of special interest to the clinician.

In the third place, the instruction for undergraduates in the department has been enhanced by just so far as the character of our work has been improved. The introduction of graduate students as clinical assistants in the department has proved a most valuable asset for the patient and the staff as well as for the undergraduate student, and incidentally, we have solved the most difficult problem connected with preparation for practice in any special field, namely, the problem of providing in a satisfactory manner that work which is essential for the first or fundamental year's training for special practice.

In conclusion, I would point out that the difficult part in graduate training preparatory for special practice is this first or fundamental year which should include facilities for the student to complete his knowledge of the fundamental sciences at the same time that he is acquiring training for making careful examinations and learning how to evaluate his findings. When this foundation work has been properly acquired it will always be a relatively simple matter for a student to complete his preparation. The latter work need not necessarily conform to any one mould. For example, opportunities for some will exist to serve as residents in suitable hospitals; for others the same goal will be reached by study in foreign medical centers.

This discussion of the problems of the outpatient clinic and of the relation of these problems to that of graduate training in clinical medicine serves to emphasize the dependence of such work on a university association. Isolated institutions are not prepared to take part in the type of graduate work which we are here discussing. Those universities which have the vision to recognize the increasing importance of this problem of graduate clinical training and which succeed in providing facilities for this important first or fundamental year in the preparation for men looking forward to special practice will be making a substantial contribution toward the solution of an outstanding problem in medical education.

THE PLACE OF PEDIATRICS IN UNDERGRADUATE TEACHING

A. Graeme Mitchell
University of Cincinnati College of Medicine

There is a spirit of unrest in medical education which leads to the thought that methods of instruction as employed at present are incorrect. This does not seem to be due to agitation by reformers, but is an indication of something fundamentally "rotten in Denmark." There is no doubt that improvements are necessary, and there is nothing startling in this. "Letting well enough alone" is a form of procedure which, while occasionally applicable, is not the method by which progress is made.

Students of medical education tell us that it would be impossible to conduct successfully any other type of school in the manner in which most medical schools are being managed. Whether it is possible or even desirable to model medical teaching along the lines of other education need not be discussed here, but it may be pointed out that medicine is essentially a graduate study, and that comparisons, if they are made, should be with this in mind.

The study of the development of the child and, secondarily, the diseases of early life occupies a definite place in the medical curriculum. A discussion of this is the primary object of this presentation; other phases of medical education will be touched on only as they apply. It may be taken for granted that no defense is needed for the prominence pediatrics has gained in teaching and practice—the things accomplished by the relative independence and recognition of the subject justify this. It need not be stressed that independence can be and should be synonymous with cooperation and coordination. There would hardly be any necessity for putting these thoughts to the indignity of print if it were not for the fact that there are those who apparently consider pediatrics as a specialty of the type of otology, laryngology, proctology, surgery and the like, and forget that it is the rounded-out study of the child and its problems. Pediatrics cannot be compared with specialties which are simply anatomic distributions or systems of therapeusis. Surely, it is not correct to compare the importance of the whole child to an ear, a tonsil or a rectum. It remains only to show the place of pediatrics in the teaching of the future and this involves a consideration of the following points: A. The function of the medical school: B. The type of medicine of the future.

Most medical schools have as their primary duty the preparation of the student for the practice of medicine. It is assumed that whatever the future of the student—whether he will enter general practice or devote his life to one of the fundamental sciences or clinical specialties—he requires a certain basic training. The education he receives must be supplemented by hospital, laboratory or other experience. To function fully, the medical school and its individual clinical departments must have control and care of patients and must do graduate and investigative work as well as carry on undergraduate instruction. These lines of endeavor are complemental, and stimulating to the others.

Of the greatest importance in the proper planning of medical education is an analysis of medicine as practiced. How are the principles of medicine which are being taught applied to the patient? Information gained from observation and inquiry leads me to believe that about 30 per cent., and often more, of the general practitioner's work is with children. Furthermore, practically every specialist comes in contact with children. Any studies which are being carried out which do not specifically ascertain the proportion of services rendered by the general practitioner and specialist to children will be of little value in formulating correct ideas on medical education. The English studies made, as they were, on insurance practice are not very helpful, particularly because of this deficiency. However, even if there were available accurate statistics of the most desirable type, the place of pediatrics could not be decided entirely on such a basis.

Not even the most foolish optimist can insist that the bulk of medical practice as carried out is ideal. To make better practitioners in the future should be an object which even the most helpless pessimist cannot deny as a possibility. Here is the crux of the matter. Medicine of the future will certainly be applied so that more and more is done in the prevention of disease and in the correction of remedial defects. There can be no argument that the time for this is in early life. Who is to stress the importance of these truths and to teach them but the pediatrist? With his training and knowledge of the child and its peculiarities he is the only one fitted for the job. If these things are acknowledged, pediatrics assumes even more prominence in the future than it has in the past, and, whatever the adjustments in curriculum, it necessarily follows that due consideration must be given to it. This should be done specifically and not as a specialty or a branch of this or that but as a major subject of primary importance.

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THE ANNUAL MEETING

The thirty-eighth annual meeting of the Association will be held in Montreal, October 24, 25 and 26. The Mount Royal Hotel will be headquarters; the meetings will be held in McGill University. Arrangements are now under way with the Canadian Pacific Railroad whereby the travel of those attending the meeting will be made comfortable. Reservations for transportation and Pullman can be made by those who will pass through Chicago by writing to the Secretary.

The program is well under way. The topics listed for discussion will not fail to elicit interest and information of value. In the past, the program has never failed to meet with approbation. We predict that the 1927 program will do as well as previous ones, if not better. The topic of outstanding interest to be discussed—in a wholly informal way—is extramural clinical teaching in which a very considerable degree of interest is being evinced at this time. Some schools are now engaged in working out a plan of extramural teaching, and others have a plan in contemplation for next year. Therefore, a free discussion cannot fail to be of help to the representatives of all the schools.

All of the sessions are open to every one interested or engaged in medical teaching. This is a point that cannot be stressed too much. Many faculty members have been under the impression that only the dean is privileged to attend. That is not so. Anyone may attend, but only the dean, as the representative of the faculty of the school, has voting privilege. The discussions should be participated in by anyone who wishes to do so. The program is in no way reserved for official representatives of schools. Every faculty member is cordially invited and encouraged to attend the meeting and to take part in the discussions. A large attendance of teachers will ensure that the greatest good will accrue from these meetings. The first and most important function of this Association is to promote better, more effective teaching in medical schools, and thus raise the status of medical education to the highest plane. Its accomplishments in this direction have been noteworthy.

At the 1926 meeting the attendance reached the high point of 90 per cent. of the membership. Year by year this percentage has grown greater. This record should be maintained at the Montreal meeting.

Representatives and others who pass through Chicago on the way to Montreal will find special accommodations provided for them on the Michigan Central-Canadian Pacific train "The Canadian" leaving from the Central Station (Roosevelt Rd. and Michigan Ave.) (special car), at 5:40 p. m., October 22, arriving in Montreal the next evening at 5:10 p. m. or at 8:45 a. m. October 23, arriving in Montreal at 8 a. m., October 24.

Relative to rail rates and sleeping car reservations, communicate with Mr. T. J. Wall, General Agent, Canadian Pacific, Room 1042, Straus Building, Chicago.

COMMISSION ON MEDICAL EDUCATION

The Commission was organized in October, 1926. Since then, the director of study, Dr. W. C. Rappleye, has accumulated a voluminous mass of information, both original and statistical, bearing on many phases of the problem which the commission has set itself to solve. This material has been sifted, analyzed, culled and is now available in the form of a preliminary report that has been published in pamphlet form. Copies of this report have been sent to all persons and institutions whose names appear on the mailing list of this Association—and to many others who are interested in medical education. Additional copies may be had by writing to Dr. W. C. Rappleye, 215 Whitney Avenue, New Haven, Conn.

It is impossible to abstract this report in the space avaliable for that purpose in this *Bulletin*. Furthermore, it should not be abstracted, because all teachers and educators should read the whole report with leisure and give it careful thought. It is an excellent report, one which contains much food for thought and is full of promise of an epoch making addition to medical education when it is completed. It is being distributed free of charge.

One topic will be selected for purposes of emphasis. A questionnaire was sent to a considerable number of practitioners asking for criticisms of their medical education. The chief criticisms were: 1. There is overcrowding in the schedule of work throughout the medical course. 2. Much of the teaching in the science courses in both laboratory and theoretical work does not contribute to a sufficient understanding of these basic sciences on which intelligent practice or other medical work depends. 3. Too much of the clinical teaching is from the standpoint of the specialist and on rare diseases, and not enough from the standpoint of the needs of most patients. 4. The divided responsibility for the care of patients and the impersonal attitude so frequently taken toward patients in the hospital and clinic handicap the preparation of students for the assumption of the individual responsibility required in practice, and for the large emotional and psychological factors seen in many illnesses.

These criticisms confirm the conviction held by many, perhaps all, medical educators for a long time. Steps have already been taken by some schools, and others are getting ready to do so in the near future, to reshape the curriculum so that these criticisms will no longer apply. It is well to be "a coupla jumps" ahead.

INSPECTION OF MEMBER COLLEGES

At the annual meeting of the Association held in October, 1926, the Executive Council recommended that member colleges be inspected more often than has been done in the past. This recommendation was prompted by remarks made by the representatives from a number of the larger medical schools of which no inspection has been made for some time. It is felt that these inspections are not inspections at all; that they are surveys. They serve to establish a closer relationship between the Association itself and the member colleges. The schools

that have been "inspected" are so pleased with the result accruing from such inspection,—that they are asking for more frequent inspections, and those that have not been inspected, almost feel slighted. It would seem that more frequent, carefully made inspections, under the aegis of this Association, should prove a potent factor in remedying what are regarded by many as deficiencies in medical education and medical teaching. Each school really is somewhat isolated, except for occasional visits of a more or less personal nature from members of the faculties of other medical schools. While such visits are no doubt of value, they are not comparable to a visit made by an experienced inspector, one who can relate from personal experience what all the other schools are doing, especially if it is of an outstanding nature but too new to have been reported on in a medium that is accessible to every one. Any criticism made is constructive in nature.

The president of a large and favorably known state university suggested that a letter be sent to the presidents of all state and other universities having medical schools and asking for an opinion on the worth of inspections that have been made and the desirability of more frequent inspections. The comparative agreement of the many replies received was astounding. Space limitations forbid publishing these letters in full, but excerpts taken from them both "for" and "against" disclose a state of mind, bordering closely on unanimity, favoring inspections per se—and more of them.

* * *

I am strongly in favor of frequent investigations of medical schools by the officers of the Association of American Medical Colleges. In my experience these inspections have been carried on in a sympathetic manner and they have been immensely stimulating and helpful.

* * *

I am of the opinion that fairly frequent inspections ought to be a good thing for the medical schools of the country.

* * *

We regard these inspections as very helpful and are very favorable to the suggestion that they be extended, if possible, and that increased expenditures for the purpose would be more than justified.

* * *

I am sure that such an inspection of the various medical schools belonging to the Association is of great value to the schools.

* * *

In place of the old type of formal police inspection, I suggest that the officials responsible for the medical schools of today be urged to encourage friendly visiting and frank discussion and reports. Each school might agree to pay the expenses of one or more visitors to two or more schools each year and to vary the schools visited from year to year so as to broaden the outlook. In behalf of schools too poor to provide traveling expenses of this kind, the Association might appeal to outside sources.

* * *

Frequent inspections of our medical schools by committees appointed by the Association of American Medical Colleges are advisable for several reasons: (*a*) For their effect on the teaching personnel. Teachers, knowing that their departments and their work are to be subject to inspection with its implied recommendations will exercise greater care in the conduct of their duties. (*b*) New ideas as to methods and equipment will be brought to the school by the examining committees. (*c*) The recommendations of the committees will be apt to be given greater credence by the board of regents and the state legislature than recommendations made by the officers of the school as the former can in no way be considered as advanced for any selfish interest.

* * *

Some inspections are very valuable and some are less so, depending, of course,

on the qualifications of the inspector. In general, however, any inspection is likely to be helpful because it brings to the school a knowledge of accomplishment elsewhere and gives the advantage of a new point of view which is likely to keep the school from being satisfied with itself, and possibilities for improvement actually exist.

* * *

Theoretically, of course, given an appropriate group of men to make such an inspection, and the proper cooperation from the institution, much might be gained. It would seem to be an excellent way of stimulating the development of schools, but much may be dependent on the two factors mentioned above.

* * *

I express the hope that plans might be made whereby more frequent investigation and inspection might be made of member colleges of the Association of American Medical Colleges.

* * *

We are heartily in sympathy with the authorized inspection of medical schools —by this, I mean, under the auspices of an organized association of colleges, such as yours appears to be. A complete inspection of the school does not seem to call for more than one visit in every five years.

* * *

We will be very glad to be inspected by the officers of the Association of American Medical Colleges, feeling that such inspections are an inspiration and often result in very helpful and conservative criticism. Anything that we can do to encourage the carrying out of more frequent inspections will be gladly done.

* * *

We would welcome more frequent inspections of the institution and its organization. The administration and faculty are both in very hearty accord with the suggestion.

* * *

The Dean is of opinion that so far as we are concerned further inspection would be of no advantage.

* * *

The Chancellor is in accord with the policy of the Association of American Medical Colleges and has been very much interested and instrumental in the progress at our College of Medicine. I am sure he would be glad to confirm any action that might officially be taken.

* * *

The inspections made by your organization are very valuable, indeed, and should be made with reasonable frequency. Of course, when made, they should be thorough and include conversations with the medical school and general university authorities.

* * *

I agree that more frequent inspections would tone us up better and would keep us more on the qui vive. I think they should cover teaching and research, as well as equipment and building, and should be suggestive of how improvements should be made—helpful in every respect, and, of course, if we are not doing our duty we should be told so in plain terms. We will welcome more inspections of this kind.

* * *

It would seem that schools that desire inspection and advice should themselves meet the expenses incident thereto, and that the Association should meet the expenses incident to the inspections which it requires.

* * *

We are in sympathy with having more inspection visits to our medical school. Our wide separation and isolation from other medical centers makes this especially desirable on our part. We hope that we may be able to devise some method whereby such inspection trips may be made more frequently.

* * *

We would be in complete accord with a policy of frequent and complete inspections. We believe that there would be much to gain from this policy.

* * *

We should welcome inspections, at least one every two years. I sincerely trust that some arrangement can be made whereby this will be possible.

* * *

We have profited much in past years by inspections of the Association of American Medical Colleges.

It seems to us doubtful if a systematic program of inspection of medical colleges by the Association is necessary in the next year or two.

* * *

The Dean of the medical school is of the opinion that there is no great need for more frequent inspections of medical schools.

* * *

Our school is heartily in accord with the idea that more inspections should be made.

* * *

Some arrangement by which a much more frequent inspection could be made would be a very important contribution to the progress of medical education in this country.

* * *

We are in hearty sympathy with the suggestion of more frequent inspections by your association of the medical schools throughout the country.

* * *

I see no necessity for the Association of American Medical Colleges to make inspections of schools other than medical schools applying for admission to the Association.

* * *

There would be advantage in making a study of the strong points of medical schools and in broadcasting the results.

* * *

Our Chancellor believes that the Association of American Medical Colleges should continue to inspect medical schools and to study the problem of medical education, as there is no other body so directly and definitely concerned with this matter as this Association.

* * *

Examinations of medical schools, including our own medical school, should be welcomed by their administrative officers at any time.

* * *

Such an arrangement as you suggest for the investigation of the different schools will certainly be very desirous, especially with schools far away from the centers of population, where the exchange of views cannot be so readily brought about. It would be very desirous for us as we are anxious to keep our work up to full grade.

* * *

We are always willing to furnish any information that will be helpful, not only to our own situation but also to the general cause of medical education.

* * *

Inspections at intervals of say from five to six years would be desirable. It might be that certain colleges should be reinspected after a briefer interval, while others of recognized standing and stability might be granted a longer period before reinspection, provided this did not rise to the criticism of undue discrimination.

* * *

We are wholly in accord with the opinion that official inspection of the various medical schools should be made. It is our opinion that perhaps once in two years would fill the requirements and permit adequate intervening time to meet the criticisms suggested. Certainly any movement that looks toward more adequate study of our institution, by those competent to make constructive suggestions is to be heartily encouraged.

* * *

Occasional inspections by outside agencies are worth encouraging; they could accomplish much good.

* * *

More frequent inspections of the colleges of medicine would probably meet with the approval of the universities. If the tendency to diversify the present offerings of medical colleges goes on and if the rigidity which present state legislation and state boards have imposed on medical colleges is relaxed, the necessity for inspection would be all the greater. The purpose ought not to be to bring every medical school to a stereotyped curriculum, but to see that the experimentation in curricula goes on on a high level and with recognized efficiency.

* * *

The only hindrance to carrying out this program is the lack of adequate finances. The financial status of the

Association and other conditions necessitate curtailing the number of inspections for the present, making as many as can be made. Perhaps a "way out" will soon be found. Any changes in medical teaching must be made by the schools themselves. Inspections spread information, point out defects, offer the remedy to overcome these and are a great help in applying such remedy.

HOSPITAL TEACHING

The Hospital Number of the *Journal of the American Medical Association** is replete with information on the subject of hospitals in general, nurses' training and training schools, hospital facilities, teaching in hospitals, interns, etc. Of special interest to medical schools is the section dealing with interns and intern training.

The Council on Medical Education and Hospitals has accredited 578 hospitals for intern training. These hospitals have a bed capacity of 160,886 and need 4,952 interns. Thus all the graduates of 1927 can have an internship in an approved hospital. The term of service in these hospitals varies from 12 to 33 months. Many offer opportunity for resident and assistant resident positions. In only 62 of these hospitals are the interns secured by examination; in 10 by examination or appointment, and in the remainder by appointment only. Information as to the time of selection is not given, which is rather unfortunate because it is the one point in which medical schools have particular interest. Only 184 of these hospitals do not pay their interns any salary; 201 pay up to $25 per month; 130 pay between $25 and $50; 9 pay between $51 and $100, and 20 pay more than $100.

The total number of hospitals in the United States is 6,946, with a bed capacity of 859,445. Clinical laboratories are maintained in 4,170; roentgen-ray departments in 4,103 and outpatient departments in 1,992. If the hospitals in U. S. possessions are added, the total number is increased to 7,194; beds to 880,339; clinical laboratories, 4,286; roentgen-ray departments to 4,167; with 6,388 interns.

The total number of hospitals in Canada is 458, with a bed capacity of 62,500; interns, 434; clinical laboratories, 209; roentgen-ray departments, 226. Only 6 of these hospitals are acceptable for intern training.

The data on the number of schools that either own or control one or more hospitals for teaching purposes are significant of the great advance that has been made in clinical teaching in the past decade. However, personal observation and knowledge modify the published data somewhat. Whether mistakes in reporting or in interpretation of reports are responsible for discrepancies cannot be determined. The discussion will be based on actual facts alone. They are indicative of astounding development in clinical teaching which cannot fail to be a source of great satisfaction to medical educators and teachers. With the passing of a few more years, an even greater onward march will be apparent.

Today, 31 schools actually own a hospital that is used wholly or in part for teaching purposes. Seven schools have such splendid control of the medical and teaching services in an affiliated hospital as to be tantamount to ownership. Besides being able to claim ownership of a hospital, ten schools also control one or more affiliated hospitals. The effective-

*April 30, 1927.

ness of the teaching done in these hospitals will not be discussed at this time. However, it is a profitable field for study and investigation.

Thirty-one schools claim control of a hospital for teaching purposes. Ten of these schools also claim ownership of a hospital. Three schools in this group of 31 are municipal institutions, one being a part of the public school system of the city in which it is located. Each of these three cities has a splendidly functioning city hospital in which the clinical teaching of the school is being done. Does not that situation virtually imply "control"?

Personal observation leads to the conviction that little, if any, effective teaching is being done in some "owned" hospitals, and that some of the most effective teaching is being done in "controlled" hospitals.

Ten schools claim neither ownership nor control of a hospital. Eight of these are "two year" schools. One of the two remaining schools—"four year" schools—is doing very fine teaching in a hospital over which several other schools claim to have control. This school should, therefore, be placed in the "control" group; in fact, no school can claim ownership of this hospital. The teaching is done by agreement by which all the schools concerned have an equal share. The remaining four year school without "ownership" or "control" has very satisfactory teaching privileges in a large general hospital that is splendidly equipped for and makes every effort to foster and promote clinical teaching in its wards.

None of the three Canadian schools in membership in this Association owns or controls a hospital, but are given almost unlimited teaching privileges in hospitals well equipped for that purpose. One of these schools contributes a not inconsiderable sum of money annually for the maintenance of a hospital which nominally is city owned but offers all of its facilities for teaching.

Only one of the two year schools owns a hospital, and good use is made of the teaching facilities.

On the whole, it may be said with a considerable degree of positiveness that every medical school can, if it will, have ample clinical teaching facilities in a well equipped hospital. Within the past five years hospitals have been making every effort to secure teaching because it is generally recognized by hospital authorities and others that the effectiveness of the medical service in the hospital is directly proportionate to the amount of teaching that is done; the more teaching, the better the service given to the patients. Even the patients have to recognize this fact, and it is not unusual to have patients ask, or insist, that they be made the subjects of teaching. All that remains to be done is to organize this teaching by devising ways and means which will permit of making the best possible use of these facilities in the training of medical students for the practice of medicine.

Thirty-Eighth Annual Meeting

MONTREAL

Oct. 24, 25 *and* 26, 1927

College News

JOHNS HOPKINS UNIVERSITY — President Frank J. Goodnow has announced that the university, after two years of preparation, is now in a position to operate primarily as an institution for graduate study and scientific research, with 80 per cent of the collegiate work concentrated in the first two years of a college sharply segregated from all graduate departments. It is planned that the collegiate work, even in its curtailed and segregated form, will be continued only temporarily.

Dr. John M. T. Finney, professor of surgery, who gave the annual Hunterian lecture in London, has been made an honorary fellow of the Hunterian Association and also of the Medical Society of London.

Dr. Ira Remsen, professor-emeritus of chemistry and president-emeritus, died on March 4, aged 81 years.

The degree of doctor of medicine, *honoris causa,* was conferred on Dr. John J. Abel, professor of pharmacology, November 4, 1926, by a vote of the faculty of medicine and the academic senate of the John Casimir University of Lwow, Poland.

The campaign conducted by the Johns Hopkins University half-century committee for endowment funds for the university and the hospital, closing December 31, 1926, resulted in total contributions of $7,022,019 from 3,992 subscriptions.

Dr. Edwards A. Park, Sterling professor of pediatrics at Yale University School of Medicine, New Haven, has accepted the professorship of pediatrics and the position of pediatrician-in-chief of the Johns Hopkins Hospital, to succeed Dr. John Howland, who died in June, 1926.

The General Education Board of the Rockefeller Foundation has made a gift of $750,000 for a new medical library, and in addition has agreed to give a sum, annually, sufficient to meet a portion of the running expenses, provided the university raises the rest. If these conditions are filled, the board will give, in addition, $250,000 at the end of five years, provided the university raises $500,000 on its own account. The library will be dedicated to Dr. William H. Welch, first dean of the medical school, and at present professor of medical history; it will cost $600,000, be 76 by 140 feet, three stories high, and of Italian Renaissance architecture; it will contain 400,000 volumes, about 50,000 of which will be taken from a library now housed in various school and hospital departments at the university.

ALBANY MEDICAL COLLEGE—The new building of the college is practically completed. It is essentially a six story building, about 49 by 125 feet, of modified colonial type, and is connected with the Albany Hospital on the first floor and in the basement. The work of the department of anatomy is being given in the new building now, and other departments will move in as the respective rooms are finished. The first floor is to be occupied by the executive offices, faculty room, library, museum and classrooms. The second floor will be devoted almost exclusively to physiology. The third floor will house the department of chemistry, a large laboratory for biochemistry will also be used for certain phases of clinical pathology, and another large laboratory room adjacent to the chemical laboratory. The fourth floor will be for

anatomy, histology and embryology. The fifth floor provides space for animals, including detention, sterilizing and operating rooms, housing quarters, and a large room for gross anatomy which is unusually well lighted. The new hospital unit will not be completed until the close of the present school year. It is an eight story addition to the teaching hospital and will add about 210 beds, making the total capacity of the Albany Hospital about 600 beds.

HARVARD MEDICAL SCHOOL—The annual report of the treasurer of Harvard University shows that the assets of the university for 1925-1926, not including lands and buildings, were $86,540,286. The cost of maintenance of the various departments was $8,153,031. Harvard College, including the Graduate School of Arts and Sciences received the largest sum, $1,681,308.79; the Medical School came next with $675,943.89; the Graduate School of Business Administration third with $513,095.84; the law school fourth with $334,849.56. Additional sums given to the Medical School were: on courses for graduates, $44,231.02; heat and power plant, $209,343.03; School of Public Health, $189,959.69, Collis P. Huntington Memorial Hospital, $140,194.66.

Dr. Richard Willstaetter, formerly professor of chemistry in the University of Munich, gave a series of lectures under the Edward K. Dunham lectureship.

A gift of $11,450 has been made to the Medical School to be known as the Henry Ehrlich Memorial Fund, the income to be used for the assistance of needy or worthy students.

Through the agency of Mrs. Stanley McCormick, a fund has been established to support an investigation on the relation of endocrine factors to nervous functions. The work will be carried out under the direction of Dr. R. G. Hoskins, in association with Dr. Milton O. Lee.

UNIVERSITY OF MICHIGAN—Gifts totaling more than $365,000 were accepted for the university by the Board of Regents at the February meeting.

Among those who will conduct courses in the summer school at the University of Michigan this year are: Dr. Hugo Randolph Kruyt, professor of chemistry at the University of Utrecht; Dr. Una Fielding, of the department of anatomy at the University of London; Professor William W. Cort, of the school of hygiene and public health at the Johns Hopkins University.

Dr. Kenneth Fowler, director of laboratories of the University Hospital, has resigned to accept the directorship of the department of pathology at the Geisinger Memorial Hospital, Danville, Pa.

Receipt is announced of a gift of $45,000 a year from July, 1927, for five years, from anonymous sources, to be used toward "discovering and promoting scientific knowledge of the causes, prevention and cure of cancer and other growth processes." President C. C. Little is designated director of the research contemplated, and Dr. L. C. Strong, of the Bussey Institution, Harvard University, is to be one of the investigators.

TULANE UNIVERSITY OF LOUISIANA—It is reported that work will be begun on a new twelve story building for the medical school at a new site on Tulane Avenue.

Arrangements have been made with the Ross Tropical Institute and Hospital of London, England, whereby an exchange of students will be made between the in-

stitute and the department of tropical medicine at Tulane University, New Orleans. Students from Tulane who wish to carry on research in certain fields of tropical medicine will be sent to the Ross Institute and research workers from there will come to Tulane. The arrangement was made and announced through Prof. Aldo Castellani, who is honorary director of the Ross Institute and head of the department of tropical medicine at Tulane.

Tulane University has installed a new academic-medical course, effective next fall, which will prescribe three years of scientific work in the College of Arts and one in the medical school for a degree of bachelor of science. The new course is much the same as the one now in force, except that at present two years of work in the premedical sciences and two years in the medical school is required. Instead of calculus, as required now, a year of physics will be required, and three years of chemistry and two of biology.

George Washington University—Dr. William Mather Lewis has resigned the presidency to become president of Lafayette College, at Easton, Pa.

University of Pennsylvania — According to press reports, the terms of the will of the late Hill S. Warwick, of New Jersey, provide that his estate of $100,000 is to go to the university on the death or marriage of his sister. It is stipulated that the bequest be used in part for experiments on the higher apes with a view to increasing knowledge of the cause, prevention and cure of disease.

Funds for the further development of the University of Pennsylvania's medical facilities have reached the $1,235,000 mark with the receipt of new gifts amounting to more than $135,000. A total of $3,050,000 is sought.

A gift of $25,000 to the Henry Phipps Institute of the University of Pennsylvania for research work for the year beginning July 1 was made by Charles H. Ludington, Ardmore, with the provision that the institute raise $50,000.

Robert J. Formad, instructor in histology, is now working as a specialist in rabies in the U. S. Bureau of Animal Industry.

The provost of the University of Pennsylvania announced the organization of a new department of pathology coordinating the teaching and research activities in pathology in the university's school of medicine. Heading the department will be Dr. Eugene L. Opie, director of the laboratory of the Henry Phipps Institute. Dr. Edward B. Krumbhaar, who was elected professor of pathology, will have charge of the undergraduate teaching in the department. Dr. Herbert Fox, director, William Pepper Laboratories of Clinical Medicine in the University of Pennsylvania Hospital, was elected professor of comparative pathology and Dr. Baldwin Lucke was elected associate professor of pathology. In addition, the following of professional rank will be on the staff of the new department: Dr. Joseph McFarland, professor of pathology; Dr. Morton McCutcheon, assistant professor of pathology; Dr. Stuart Mudd, assistant professor of experimental pathology, and Dr. Damaso Rivas, assistant professor of parasitology. Dr. Opie will continue his directorship of the pathologic laboratory at the Phipps Institute; Dr. Fox will retain his directorship of the Pepper Laboratory of Clinical Medicine and continue his pathologic studies at the Zoological Gardens.

JEFFERSON MEDICAL COLLEGE—The senior class will present to the college, May 26, a portrait of Dr. Hobart Amory Hare, Sutherland M. Prevost professor of therapeutics, materia medica and diagnosis. Portraits of Dr. Thomas McCrae, Magee professor of physiology and medical jurisprudence, were presented to the college in 1925 and in 1926 by the graduating classes.

LONG ISLAND COLLEGE HOSPITAL—March 5, 1927, the Medical College of The Long Island College Hospital, Brooklyn, inaugurated its new course in medical literature and bibliography. So far as is known this is the first established course of this nature included in the curriculum of any medical school. An attempt is being made to show the student the real value of literature which constitutes such an important part of the background of his work; and to teach him how to use a library. The lecturer in this course is Mr. Charles Frankenberger, librarian of the Medical Society of the County of Kings, who has wide knowledge of bibliography and of the relative values of medical literature. To enhance the value of this course, and with a cooperative spirit, the library officials of the Medical Society have created a special student membership with definite library privileges.

UNIVERSITY OF MONTREAL—Dr. Pierre Masson of the University of Strasbourg, Alsace-Lorraine, has accepted the professorship of pathology at the university, and the position of pathologist at Notre Dame Hospital. Dr. Masson was for many years at the Pasteur Institute, Paris.

Dr. Telesphore Parizeau, professor of clinical surgery and surgeon to Notre Dame Hospital, has been appointed director of studies in the medical faculty and vice dean.

DETROIT COLLEGE OF MEDICINE—The Receiving Hospital, in which much of the clinical teaching of the college is done, has been renamed the Detroit General Hospital. A million dollar addition was recently opened.

The college has completed a new six story building which is the first of a three unit plant intended to replace the old structure. The new building cost about $500,000. It houses the laboratory and lecture rooms of physiology, biochemistry and operative surgery; animal quarters, an auditorium and the library.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE—This school and the Missouri Social Hygiene Association are giving an advanced course in social hygiene at the medical school for social workers, graduate nurses and officers and members of governing boards of organizations interested in this field.

WASHINGTON SCHOOL OF MEDICINE—A radiologic institute is planned which will provide facilities for research in the field of radiology, and will contain roentgen-ray and radium laboratories and treatment rooms. The institutions served by the institute will be Barnes Hospital, St. Louis Children's Hospital, St. Louis Maternity Hospital, Washington University Dispensary, and when completed, the MacMillan Eye, Ear, Nose and Throat Hospital. The general education board of the Rockefeller Foundation, New York, and the family of Edward Mallinckrodt, St. Louis, have jointly contributed $1,000,000 for the institute.

COLUMBIA UNIVERSITY—The joint administrative board of Columbia University-Presbyterian Hospital has defi-

nitely accepted plans for the erection of an outpatient department at Broadway and 168th street. It is estimated that the building will cost $1,000,000.

The will of the late Dr. Walter B. James bequeathed $25,000 to the endowment fund of the medical school.

An anonymous gift of $100,000 for the building of the new Neurological Institute in connection with the Medical Center at 165th Street and Broadway, New York City, has been announced; the estimated cost of the institute with equipment is $1,400,000, and of this sum about $800,000 has been pledged.

T. Coleman du Pont has created a special tuberculosis fund of $5,000; Mrs. Edw. D. Faulkner has given $2,500 for salaries in the tuberculosis department, and A. J. Rosenthal $2,500 for research in pathology.

Dr. Frederick H. Dieterich, formerly instructor in pathology in Columbia University, has been appointed director of laboratories at the Good Samaritan Hospital, Cincinnati.

Dr. Samuel R. Detwiler, associate professor of anatomy at Harvard University, and Dr. Philip E. Smith, associate professor of anatomy at Stanford University, have been appointed professors of anatomy.

It is reported that the present site of the Presbyterian Hospital, Seventieth and Seventy-first street has been sold for about $7,000,000. The site will be improved with high class apartments and shops.

Dr. Frederick P. Gay, professor of bacteriology, has been elected an associate member of the Belgian Society of Biology.

NEW YORK POST GRADUATE MEDICAL SCHOOL—Dr. Thomas H. Cherry has been appointed professor of gynecology.

JERUSALEM MEDICAL SCHOOL—Dr. Emanuel Libman, of Mount Sinai Hospital, has been appointed a member of the faculty of the medical school of the new university in Jerusalem.

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL—Dr. C. M. Medlar, professor of pathology, and assistant professor of pathology at the Wisconsin General Hospital, has resigned. He has accepted a position with the Mt. McGregor Sanitarium in New York.

Dr. Ralph M. Waters, Kansas City, Mo., has been appointed assistant professor of surgery in charge of anesthesia on the staff of the Wisconsin General Hospital.

CONNECTICUT TOWNS WITHOUT PHYSICIANS—About 30 per cent of the towns in Connecticut do not have physicians, according to a study made by the state department of health. Among the towns under a population of 1,000 there is said to be on 80 per cent shortage of physicians. There are only five physicians in the state under 25 years of age, and they are in cities of more than 25,000 population. The older physicians, those of about 65 years of age, are for the most part practicing in towns ranging from a population of 4,000 to 25,000. The thirty-two physicians over 80 years of age are in two of the largest cities. In the age group 25-29, the physicians are fairly well distributed in towns of all populations.

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE—The assistant dean and professor of pathology, Louis A. Turley, Ph. D., has received information from a majority of the 304 graduates of that medical school with regard to their average monthly income. A compilation of the figures showed, according to the

Journal of the Oklahoma State Medical Association, that the average monthly income of these graduates was $1,100, and that they range from $300 to as much as $4,000. Most of them, according to the foregoing authority, are still practicing in Oklahoma; some are in Mexico, Canada, in foreign missionary work and in the U. S. Army. The state journal wonders how much of this income is derived from the actual practice of medicine and how much from "oil investments."

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE—Dr. Harry C. Saunders has been appointed instructor in dermatology and syphilology.

STANFORD UNIVERSITY SCHOOL OF MEDICINE—The following promotions of members of the staff have been made: To full professorships in medicine, George D. Barnett (internal medicine); W. Edward Chamberlain (radiology); Henry G. Mehrtens (neurology). To associate professorships in medicine: Robert R. Newell (radiology) and Harry A. Wyckoff (clinical pathology). To associate professorship in obstetrics and gynecology, C. Frederic Fluhmann. To assistant professorship in medicine, Lloyd B. Dickey (pediatrics). To assistant professorship in pharmacology, Maurice L. Tainter. To instructorship in surgery, George D. Brown. To associate clinical professorships in obstetrics and gynecology, Karl L. Schaupp and Henry A. Stephenson. To assistant clinical professorship in obstetrics and gynecology, Hans von Geldern. To associate clinical professorship in medicine, William Hulbert Barrow (internal medicine). To assistant clinical professorship in medicine, Norbert J. Gottbrath (neurology). To assistant clinical professorship in medicine, Roland P. Seitz (pediatrics). To assistant clinical professorship in surgery, Harold A. Fletcher (oto-rhinolaryngology). To clinical instructorships in medicine, James C. Parrott (pediatrics) and Stuart C. Way (dermatology). To clinical instructorships in surgery, J. Minton Meherin, Robert A. Ostroff and Lorruli A. Rethwilm (anesthesia).

Dr. Richard G. Brodrick has been appointed physician superintendent of the Stanford Hospitals, and professor of hospital administration. Dr. Brodrick graduated from Cooper Medical College in 1892. He entered the U. S. Navy, from which he retired in 1899. From 1908 to 1919 he was connected with the San Francisco Board of Health, and from 1914 to 1919 he served as superintendent of the San Francisco Hospital. From 1919 until 1927 he has been director of the hospitals of Alameda County, California, and consultant to the Highland Hospital. Dr. Brodrick is now the president of the American Hospital Association.

MARQUETTE UNIVERSITY—Two courses in hospital administration and management will be given during the summer at the College of Hospital Administration: the first, a two weeks' course, beginning June 6; the other, a six-weeks' course, beginning June 25. They are open to any one interested in hospital work. Details can be obtained from Dr. John R. Hughes, dean, 131 Eleventh Street, Milwaukee.

UNIVERSITY OF TORONTO—Dr. F. G. Banting, professor of medical research, has been awarded the Cameron prize in recognition of his investigations on insulin and on the treatment of diabetes. This prize, which was founded in 1878, "may be awarded annually to a person who, in the course of the five years im-

mediately preceding, has made a highly important and valuable addition to practical therapeutics."

Dr. Oscar Klotz, professor of pathology, has returned from Nigeria, Africa, where he spent six months investigating the cause of yellow fever under the auspices of the International Health Board.

Dr. J. G. Fitzgerald, professor of hygiene, attended the International Rabies Conference called by the health committee of the League of Nations to meet in Pasteur's old home in Paris.

YALE UNIVERSITY—Professor Frank P. Underhill, of the department of pharmacology and toxicology, has been elected a member of the Kaiserlich Deutsche Academie der Naturforscher zu Halle.

Announcement has been made that Yale will found a biochemical institute, where physicians, chemists, biologists and physicists may combine their effort in attacking biochemical problems.

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE—The freshman class of medicine recently gave a dinner to celebrate the birthday of Dr. Oscar V. Batson, assistant professor of anatomy.

A replica of a fifteenth century pharmacy that was exhibited at the Paris Exposition of 1900 has been presented to the physiology department of the University of Cincinnati by Mrs. Martin H. Fischer. The central fountain, designed and modeled by Innocenti Bruno and Prosperi Francesco, is set in the wall between cases containing jars and vases, and in front of the fountain stands the apothecary's counter. The herbs are reproduced pictorially in tiles in the floor with a remarkable degree of artistry in form and color. The general idea was that of Prof. Carlo Guerrini. The ceramics are the work of the Cantagalli pottery of Florence. This exhibit has been installed in Professor Fischer's lecture room.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA—The faculty and members of the clinical staff celebrated the seventy-seventh anniversary of the founding of the college at a dinner, March 9, at the Hotel Rittenhouse.

The college has acquired a new site of 9½ acres, overlooking Queen Lane Manor, in Germantown, where it is planned to erect a new main college building costing about $500,000. A campaign for funds is now under way. The new main building will be in southern colonial style; it will accommodate 200 students and will be fully equipped with modern facilities for research and study. Dr. Martha Tracy, dean of the college and professor of preventive medicine, is visiting the alumni associations throughout the country to secure their support.

GEORGETOWN UNIVERSITY—The Serbian government has awarded the cross of the Royal Order of St. Sava, posthumously, to the late Dr. Ernest P. Magruder, who lost his life in the typhus epidemic in Serbia following the World War. Dr. Magruder was clinical professor of surgery at Georgetown University Medical School, Washington, D. C.

ANTI-EVOLUTION IN ARKANSAS—An anti-evolution bill has been introduced into the Arkansas legislature which provides: "that it shall be unlawful for any teacher in any of the universities, normal and all other public schools of the State of Arkansas, which are supported in whole or in part by the funds raised by general or special taxes levied upon the property of the people of the state, for school purposes, to teach any theory that denies the story of the di-

vine creation of man as taught in the Bible, and to teach instead that man descended from a lower order of animals, or any other source other than divine creation." Any person violating any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than $200 nor more than $1,000, and in addition thereto shall have his license to teach in any of the schools of this state revoked, and each day said section is violated shall constitute a separate offense.

UNIVERSITY OF CHICAGO—The University of Chicago has received $1,000 from Dr. Hermann Hille for a fellowship in the department of physiology for one year, to be known as the Hille fellowship in physiology. Further sums, not to exceed $500, have been guaranteed as an expense fund in connection with the fellowship.

The trustees of the university have merged the laboratory and tuition fees with the general tuition fee, establishing a net fee of $100 a quarter for undergraduates, to take effect with the summer quarter of 1927. Students will receive health, dispensary and infirmary service in the new hospital, the cost of which is included in the foregoing figure.

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE—A group of new buildings is to be erected at a cost of several million dollars, which will include general and special hospitals, research institutions and a nursing school. The institutions in the group, including those now in operation or proposed, will be affiliated with the university, but will have their own boards of trustees and their own endowment funds. The plan includes the erection on the campus of a new Lakeside Hospital, eight stories high, with 250 beds, facilities for research, and all modern devices for the welfare of patients. A new Rainbow Hospital will be erected on the present site of Rainbow Hospital, south of Mayfield Road, South Euclid, at a cost of about $350,000 for building and equipment; this building is planned to afford a maximum exposure to the sun in all wards and rooms, and, at the same time, to permit segregation of boys and girls. Rainbow Hospital is devoted to the care of convalescent children, both medical and surgical. There is to be in the group a new nurses' dormitory, between the new Lakeside Hospital and Euclid Avenue, with accommodations for 400 nurses, sufficient for those on duty at the Lakeside and the Babies and Maternity hospitals.

The new pathologic institute, for which the Rockefeller Foundation recently granted $750,000, will soon be under construction. The Allen Memorial Medical Library, owned by the Cleveland Medical Library Association and quite near the medical school, was opened a few months ago.

Mr. Samuel Mather has subscribed $1,000,000 toward the $6,000,000 to be raised for a medical center.

TUFTS COLLEGE — President John A. Cousens has announced that the proposal to move the medical school from Boston to Medford has received the approval of the college trustees and is now before the alumni for action.

MEDICAL COLLEGE OF VIRGINIA — The college plans to construct a medical library building at Clay and Twelfth streets, Richmond, adjacent to a new library building to be constructed by the Academy of Medicine of Richmond. The buildings will be connected. There will

be facilities in the college library building for administrative offices and an auditorium.

Dr. Wm. B. Porter has been appointed full time professor of medicine.

CHINA—Ging Hsi Wang, Ph. D., instructor at Johns Hopkins University Medical Department, Baltimore, has accepted a position as director of the Institute of Psychology at Sun Yet-sen University, Canton, China, and will leave about the first of May. Dr. Wang graduated at Johns Hopkins in 1923, and has been instructor in the medical school for three years.

The trustees of Yale-in-China announce the resignation of Dr. Edward H. Hume, after twenty-two years of service in China as a medical educator.

HOWARD UNIVERSITY MEDICAL SCHOOL—The new medical and dental schools building is under construction and probably will be ready for occupancy in October, 1927.

Julius Rosenwald, Chicago, has subscribed $25,000 of the $250,000 endowment for the medical school.

UNIVERSITY OF MINNESOTA SCHOOL OF MEDICINE—Dr. Frank E. Burch, of St. Paul, has been appointed head of all the head specialties to succeed the late Dr. William R. Murray. The appointment is on a part time basis so that Dr. Burch can continue his private work.

STATE UNIVERSITY OF IOWA—Dr. Lee Travis, for three years National Research Council Fellow in psychology and psychiatry, has been appointed assistant professor of clinical psychology and psychologist to the Psychopathic Hospital. His work will be devoted mainly toward the direction of research within the field of speech correction.

UNIVERSITY OF COLORADO MEDICAL SCHOOL—Dr. Ivan C. Hall, head of the department of bacteriology and public health, will give the course in general bacteriology in the University of Chicago during the summer session of 1927.

A mid-winter clinic was held at the Colorado General Hospital, February 22-25, to which all physicians of Colorado were invited. The aim of these clinics is to develop at the university a center of medical education and teaching for physicians of the entire state. Charges were not made and the demonstrations and conferences were arranged to be advantageous to the largest possible number of physicians. An invitation was extended to the physicians of the state to visit at the institution at any time to attend daily clinics, or to be guests of the medical schools and hospitals.

UNIVERSITY OF UTAH SCHOOL OF MEDICINE—Dr. Newton Miller, professor of histology and embryology, has resigned to enter practice. Dr. Martin C. Lindem, formerly professor of anatomy, has been appointed instructor in principles of surgery. Dr. Douglas L. Gamette has been appointed for half time in the department of pharmacology, and Dr. Ralph Tandowsky, half time assistant in the department of physiology. Dr. Guy Van Scoyoc in now in charge of physical diagnosis work, succeeding Dr. W. R. Calderwood. Dr. Byron Robinson, formerly of the department of anatomy, University of Arkansas, has been appointed professor of anatomy.

HAHNEMANN MEDICAL COLLEGE—Dr. Joseph Chandler, formerly associate professor of chemistry, Boston University of Medicine, has been appointed associate professor of chemistry.

Herewith is printed a reproduction of the architect's drawing of the new Hahnemann Hospital. This building will

Hahnemann Medical College and Hospital, Philadelphia

have a frontage of 150 feet on Broad Street, will be 16 stories high and contain 634 beds. There will be 176 one bed private rooms: 28 two bed semi-private rooms; 48 four bed semi-private rooms and 283 rooms containing from two to ten beds. There will be eleven operating rooms; 21 solarium rooms; one play room for the children and one large sun porch. It is planned to begin construction of this building in the summer as soon as the present college year is ended. The hospital will be the clinical laboratory of the college, and the building will also house the scientific departments.

INDIANA UNIVERSITY SCHOOL OF MEDICINE—The following promotions and appointments have been announced: Ralph S. Chappell, John Dempsey Garrett, John Kent Leasure, Lillian B. Mueller, and John Walter Carmack, assistants, have been made associates in the department of rhinology and laryngology. Homer W. Cox, Sidney S. Aronson, Martin T. Patton and Alan Leo Sparks have been appointed assistants to the department of rhinology and laryngology. Elmer Funkhouser, instructor in pathology, has been promoted to associate. H. G. Hamer and William P. Garshwiler, associate professors in the genito-urinary surgery department, have been made clinical professors. Delbert O. Kearby has been made an associate in the department of rhinology and laryngology, and chief of the dispensary. John F. Kelly, assistant in obstetrics, has been promoted to associate. Daniel W. Layman, associate professor, has been made clinical professor of otology, rhinology and laryngology. Alvin E. Newman and John R. Brayton have been appointed assistants to the department of dermatology and syphilology. Charles A. Weller has been made assistant in surgery. Leon G. Zerfas and Evanson B. Earp have been appointed assistants to the department of medicine.

The construction of a new wing to the medical school building at Indianapolis was begun in May with funds provided by the recent legislature.

ANNIVERSARIES OF GERMAN UNIVERSITIES—Four German universities will celebrate the anniversary of their foundation this year: Wuerzburg, founded 1402 (exact date unknown); Tuebingen, founded October 9, 1447; Marburg, founded May 30, 1527, and Breslau, founded November 15, 1702.

OXFORD UNIVERSITY, ENGLAND—The Sir William Dunn school of pathology was opened March 11, by Viscount Cave, lord chancellor of England and chancellor of the university.

YALE-IN-CHINA MEDICAL SCHOOL CLOSED—The *Federation Bulletin*, April, 1927, announces that the Hunan-Yale College of Medicine at Chang-sha and the nursing school have been closed. A correspondent in the New York *Times* stated that it is impossible under the existing conditions of communism and of disorder in the province to conduct educational institutions with high standards of work and discipline. Most of the faculty have left Chang-sha, three of the most important members remaining in other places hoping that the radical wing in Chang-sha will lose control and that their work may be resumed. The Hunan-Yale Hospital is still functioning under Chinese physicians. The attitude of the board of trustees is that the institution must be continued and made as permanently useful as possible, and that the ideals and methods may be modified to meet more adequately the needs of a new China. They believe that

an effort should be made to maintain a Chinese staff of at least three members in addition to the American staff now on the field, and that the staff be authorized to make such arrangements as they consider desirable for the purpose of using the hospital and other buildings for the public good. The Hunan-Yale College of Medicine is a joint enterprise between the Yale Mission and the Hunan Yu-Chum Educational Association, founded in 1914. It was the first cooperative enterprise of its kind between the Chinese and Americans, and both parties to the agreement supplied funds for expenses. The Rockefeller Foundation, since 1915, has made regular grants and has provided a laboratory building for the premedical sciences. Certain missions contributed members of the faculty and some heads of departments were Chinese.

UNIVERSITY OF GEORGIA—Dr. Henry G. Mealing, an instructor in laboratory diagnosis, Johns Hopkins University Medical Department, Baltimore, has accepted a position with the University of Georgia Medical Department.

NEW DOCTORS OF MEDICINE IN FRANCE—During the school year 1925-1926, the French faculties of medicine bestowed 1,246 doctor diplomas in medicine (Paris, 651; Lyons, 166; Bordeaux, 127; Montpellier, 113; Lille, 41; Toulouse, 40; Nancy, 33; Strasbourg, 30; Algiers, 30; Beirut 11). Among this number there were 110 diplomas conferred on foreigners, which do not give the right to practice medicine in France; of the latter more than half were bestowed in Paris. The minister of public instruction announced that on July 31, 1926, there were 10,821 students in the various French faculties of medicine, and 1,465 in the provincial secondary schools. In 1913, the corresponding figures were 8,247 and 1,497.

SCHOOL OF MALARIOLOGY—The Royal Italian government proposes to establish in Rome an advanced school of malariology which will concern itself with the study of climatic factors, including the flora and fauna of infected zones, and will especially apply itself to the study of the germ producing the malady and of Anxopheles mosquitoes. It will then concern itself with the illness itself in all its phases, and, finally, the various means to prevent the spread of the infection and to redeem the infected zones by reclaiming the soil and fostering cultivation. Instruction will be of the character of an object lesson, consisting of practical experiments on the part of the students. Lectures will be given by eminent persons, both Italian and foreign, who are authorities on the subject. The course will last from May to October. The school will be divided into two sections: one technical and scientific, reserved mostly for physicians; the other economic, reserved for engineers, agriculturists, administrative personnel and social workers. Each section will grant a diploma on examination.

RECOGNITION OF NATIONAL BOARD OF MEDICAL EXAMINERS CERTIFICATES—Holders of certificates from the National Board of Medical Examiners are registered without further examination in thirty-five states, the Canal Zone, Porto Rico and Hawaii as follows:

Alabama	Maryland	Oklahoma
Arizona	Massachusetts	Pennsylvania
Canal Zone	Minnesota	Porto Rico
Colorado	Mississippi	Rhode Island
Connecticut	Missouri	South Carolina
Delaware	Nebraska	South Dakota
Georgia	Nevada	Tennessee
Hawaii	New Hampshire	Utah
Idaho	New Jersey	Vermont
Illinois	New York	Virginia
Iowa	North Carolina	Washington
Kentucky	North Dakota	Wyoming
Maine	Ohio	

HOSPITAL INTERNSHIP — The hospital intern year has been adopted as an essential qualification for the license to practice in twelve states, becoming effective in different years, as follows:

State Board of	Affects Student Matriculants	Affects All Applicants
Pennsylvania	1909-10	1914
New Jersey	1911-12	1916
Alaska	1912-13	1917
Rhode Island	1912-13	1917
North Dakota	1913-14	1918
Washington	1914-15	1919
Illinois	1918-19	1923
Michigan	1917-18	1922
Iowa	1919-20	1924
Delaware	1919-20	1924
South Dakota	1920-21	1925
Utah	1921-22	1926

The requirements both by medical schools and by state boards are overwhelmingly if not unanimously for the rotation service in general hospitals.

ANALYSIS OF EXPENDITURES OF STATE UNIVERSITIES AND STATE COLLEGES—Higher Education *Circular*, No. 32, of the United States Bureau of Education contains an analysis of expenditure of state universities and colleges during 1924-1925, the classification including under Operation and Maintenance, salaries and wages, materials and other supplies; under Capital Outlay, equipment, land, buildings and improvements. The largest expenditure for salaries and wages is $5,000,000 at the University of California, the University of Michigan coming second with $4,500,000; twenty-eight other institutions spend more than $1,000,000 each on salaries and wages. The University of Michigan spends the largest amount for equipment and for lands and buildings. The totals for the institutions listed are salaries and wages, $79,000,000; materials, supplies, etc., $36,000,000; land, buildings, etc., nearly $22,000,000.

AMALGAMATION OF HOSPITAL MANAGEMENT IN MONTREAL—An agreement, of five years' duration, has been entered into whereby the destinies of the Montreal General Hospital, now amalgamated with the Western Hospital, and the Royal Victoria Hospital, now amalgamated with the Montreal Maternity Hospital, will be guided by a joint commission, composed of five members of the Board of Management of the Montreal General Hospital, five members of the Royal Victoria Hospital, and one representative from McGill University. While each hospital will provide its own autonomy, this commission will have power to decide on the erection of new buildings, raising of campaign funds and their distribution and correlation for teaching purposes, of medical appointments of the individual hospitals in connection with McGill University.

In 1824, the Montreal Medical Institute was inaugurated in connection with the Montreal General Hospital. This was the first medical school in Canada. The Montreal General Hospital is the first hospital in Canada to admit medical students to the wards for clinical teaching. In 1828, the doctors of the Montreal General Hospital in attendance at the Medical Institute established what is now known as the Medical Faculty of McGill University.

TULANE UNIVERSITY SCHOOL OF MEDICINE—It is reported that arrangements have been made between the Department of Tropical Medicine of Tulane and the Ross Tropical Institute and Hospital of London, providing for an exchange of students. Tulane students who may wish to carry on research in tropical medicine will be sent to the Ross Institute, and the latter will send workers to Tulane.

ROCKEFELLER FOUNDATION GIFT TO MUNICH INSTITUTION—The Foundation has given the Kaiser Wilhelm Institute at Munich $75,000 for new buildings. This sum is in addition to $250,000 previously given.

Abstracts of Current Literature

TEACHING ANESTHESIA IN MEDICAL SCHOOLS

The actual sources from which the students can gain knowledge of anesthesia are the lectures on (1) pharmachology, (2) those on surgery, (3) special lectures, usually few in number, and (4) demonstrations in the uses of anesthetics in the outpatient department, in the casuality theater, in the maternity department and in general operating theaters. In order to equip the student with the essential outfit as an anesthetist we must assume that he has undergone clinical teaching in the medical wards, so that his work in anesthetics, at least the manipulative portion, must not be carried out until fairly late in the curriculum. However, the teaching of the neophyte in anesthesia should commence quite early and be committed to the hands of the physiologist or pharmacologist, still better, each of these instructors should devote a few lectures, say three, entirely to the physiologic behavior of narcotics used as anesthetics. Demonstrations with the pithed frog and, if possible, with other animals, making use of Waller's balance inhaler, would help to inform and interest the student in a subject which is often thought to be and taught to be arid and boresome. In the pharmacology lectures greater accuracy than is often at present attained should be insisted upon and the methods of preparation and detection of impurities carefully explained. A few special lectures in the anatomy course, dealing with surface marking for nerves would be valuable in view of local analgesia. Then should come demonstrations upon the mechanical technic of anesthesia, apparatus for local, general and spinal anesthesia and approved plans in cleaning and sterilizing them. It is a very great advantage at this stage for the student to attend systematic lectures on the uses of anesthetics and these should be illustrated copiously with diagrams showing apparatus, positions of patients, methods of lifting anesthetized patients and so on. Such procedures as opening the mouth, separating the jaws, the way of introducing tongue forceps and how to pass the thread across the tongue to pull it forward should have been gone into when the apparatus technic was explained. It can with advantage, however, be explained again in this course. When the general methods of giving the anesthetics are mastered, those required for special types of operation, throat, mouth and tongue, Trendelenburg position, brain, spine and abdominal sections should be dealt with. No student can learn properly the inwardness of conducting anesthesia unless he has an opportunity of studying the patient's condition; (1) before, (2) during, and (3) after the administration. When possible the first few anesthetizations should be done for minor cases—not throat cases—in "outs," casuality and so on. This can only be done with some responsible officer. After, say, six cases, the neophyte should be handed over to one of the Honorary Anesthetists who will demonstrate to him the procedure to be carried out in the major operation theater. In this way it should be possible for the student to give the anesthetic in such a manner as to avoid any inconvenience to the surgeon. It is obvious that during the first week or so the student should be entrusted only with the sim-

pler cases. The instructor would be, as a matter of course, always at hand to deal with any minor difficulty or untoward complication. The student, if keen, will, in a month's time, have acquired quite an intelligent grasp of his subject and will daily gain experience, self-confidence together with an adequate sense of his responsibility. The point I am anxious to emphasize is this: if the routine of examining the condition of the patient before the administration of the anesthetic, the incidents of the actual inhalation, the recovery and the postoperative conditions, i.e. those concerned with the anesthetic, are carefully studied, the student anesthetist obtains a complete picture or series of pictures of the patient during the time he is, more or less, under the influence of the anesthetic. He learns that there are certain factors producing results which he can see and appreciate. Of these, some make for the advantage, others for the detriment of the patient, and knowing these facts, the student is able to note at what he should aim and what he should avoid when he encounters similar cases on subsequent occasions. It is not necessary to increase the number of hours devoted to anesthetics; what is required is that the teaching shall be systematized and so arranged that some teachers may deal with elementary aspects of the subject while the experts assume command when the actual teaching in the operating theater is being carried out. Clinical lectures, a few will suffice, should be given upon such subjects as "The Status Lymphaticus," "Postoperative Toxemia" and so on. —D. W. Buxton, *Brit. J. Anesth.*, Jan., 1927.

ALTERING THE MEDICAL CURRICULUM

The curriculum is simply a compromise effort on the part of those looking backward and those looking forward in the field of medicine. It is neither wholly good nor wholly bad. Its most marked defect is its inelasticity and the fact that it has set up certain compartments of medical knowledge. Viewed in another way, the medical curriculum is an attempt to make practical use of a certain number of months of a student's time in order to give him training that will serve him in one of the great professions. This training has to be both of a general character and technical and specific. The fundamental aim of the training should be to compel scientific thinking, impart medical knowledge, and give the technical training of the laboratory, the clinic and the operating room. As at present constituted, it strives to do altogether too many things. One of the outstanding defects in college, university and professional education has been the academic departmentalization of human knowledge. This has been particularly harmful and obnoxious in the medical school, where unripe specialization has been a curse.

As at present constituted the medical curriculum is too congested, is in the hands of too many specialized instructors, and offers an inadequate period of actual contact between medical students and patients. There is altogether too much association of the student with the discharges and extracts of patients, and too many long-winded and painful lectures, which are fine mental exercise for the lecturer, and too often needed rest periods for the students. One of the simplest and most reasonable de-

vices for the cure of the medical curriculum would be to make all lectures optional and have no examinations on lectures. No one can teach the art or the science of the practice of medicine by the lecture system. One can teach medicine by example and can guide others in their own processes of self education. The more work done by the student and the less done by the teacher, the better the product. The laboratory and all its attachments have been of enormous service to medicine, but a disproportionate part of the time of the student is used in the medical curriculum for such courses. Aside from the essential laboratory technic, it is more important that a student should be trained in all of the various methods of physical examination and in accurate observation and deduction than that he should be trained in refined laboratory technic.

The time is about ripe for a readjustment of the relationship of medical instruction to the fundamental sciences on which it rests. Physiology, anatomy and bacteriology belong primarily with the general courses of the university. They should offer opportunities to students who have no desire to become medical practitioners. They can offer an unusually satisfactory training to those seeking a sound general education as a basis for modern living. Anatomy is too often viewed as mere dissection of the human body. Its relationship to all phases of growth, development, nutrition and everything pertaining to structure is overlooked. Biology, general physiology, physiologic chemistry, hygiene, bacteriology, pathogenic and nonpathogenic, are of increasing importance in all education. Just as medicine has in the past forced chemistry and physics back on to the college and the university, so it should pass these fundamental subjects back to the university and devote its attention to the training of students who come to learn to practice medicine and who come to the medical school at the time when patients are required for instruction.

America has been distinctively defective in its research work in the fundamental sciences. The limitations of the various departments by the medical school has played its part in this unfortunate condition. With pharmacology including therapeutics, pathology and advanced bacteriology as a necessary constituent part of the work which is grouped around the outpatient clinic and the hospital, those essential scientific, laboratory and other facilities for the training of practitioners are available. Both the laboratory and the clinic should be conducted in the stimulating atmosphere of research. Just how much time is required to turn out a general practitioner is hard to state. Certainly there is no reason for considering the four calendar years the result of a sacred dispensation. There is a certain sequence of instruction required, there is an enormous vocabulary which must be assimilated, there is a large volume of needful information to be acquired, there is the necessity of learning how to use the library and the laboratory with its technical equipment, and above all of learning something of human beings and their social relationships. I see no reason why the full calendar year, with the exception perhaps of a single month, should not be used in the actual instruction of medical students. A limitation of classroom instruction to certain months and the extension of hospital and outpatient responsibility throughout the year would be distinctly advantageous.

After a thorough training in elementary work, which should be required regardless of the period of time spent in its acquisition, a proper knowledge of the use of the English language, probably one or more other languages, and various other things which go to make up a general education; and physics, chemistry, biology, anatomy in its various phases, physiology, and elementary bacteriology, the medical course proper should through proper use of the outpatient and the bed patient train a student in the fields of pathology, pharmacology and therapeutics, general medicine, general surgery, public health, obstetrics and gynecology. Every effort should be made to prevent overdivision of these subjects into subdivisions where ardent and enthusiastic specialists may burrow in by the sheer force of their turning. The ordinary specialist is a menace as a teacher for the student studying for the degree of doctor of medicine. He turns too brilliant a light on too small an object. His methods are too refined for the beginner. He is apt to require elaborate contrivances and procedures for diagnoses that are difficult.

The amount of medical information that is actually required of the young doctor in order to start out to practice medicine need not be so very extensive. If proper physical examination has become second nature to him and he understands a few emergency procedures and something of minor surgery, has a clear understanding of obstetrics and knows something of infant feeding and of the simple respiratory and digestive tract diseases, and has a knowledge of people and how to deal with them, he can, if he has been taught to look at facts squarely, by experience, industry and reading become a reliable practitioner. The curriculum often misguides individuals into the belief that they have completed their education when they have wandered successfully through its intricacies and mazes. It is difficult to train a man or a woman to work largely with his hands and senses in the care of the sick when he has been up in the present "pass the buck" atmosphere of the ordinary hospital mechanism for the diagnosis and care of the sick. We must eliminate specific hours for this and that in a specific subject, even though there is a constant striving on the part of the medical faculty to have this sort of subdivision. We need to get away from the blight of too many courses and the deplorable pedagogical technic of many medical teachers.

After the preliminary period of training in the basic sciences, including physiology, physiologic chemistry, anatomy and its subdivisions, and perhaps bacteriology has been passed, three calendar years, with one month of vacation each year, is a sufficient time for a student to have contact with patients, laboratories and teachers, to acquire the right to begin the practice of medicine. This period should be inclusive of the so-called intern year. A large part of this time could probably be spent in the outpatient clinic. The regular physical examinations which will be required more and more of physicians in the future demand an adequate understanding of the early stages of disease and of the normal control of the habits of the human body. Human understanding must be brought about by responsible human contacts. It is not what we know but what we actually are able to use that counts in medical practice. The outpatient clinic is the place for the medical student to learn by experience how

to practice medicine.—RAY LYMAN WILBUR: *Jour. Am. Med. Assn.*, March 5, 1927.

THE DUTY OF HOSPITAL STAFF TO THE INTERN

GEORGE E. FOLLANSBY, Cleveland (*Jour. A. M. A.*, March 12, 1927), believes that the intern should be a daily visitor with the attending physician on all the patients in his department, and that the orders of the attendant should be made through him, with such discussion as will explain to him why such orders are made. He should have the opportunity of making careful and complete physical examinations on all the patients whom he visits. The privilege of complete physical examinations and of diagnosis should not be restricted to ward or charity cases, but private room cases should be included as well. Provision must be made for practical work in internal medicine, in general surgery, in accident work, in obstetrics and in anesthesia. These are fundamental, and without any one of them his education is lopsided. Other branches, such as orthopedics, neurology, eye, ear, nose and throat, pediatrics, gynecology, urology and physiotherapy, are desirable, but the former are essential. The men working in these fields should not only know their subjects thoroughly but also be willing and able to impart their knowledge and experience to the intern as the cases coming under their charge present themselves as object lessons.

Besides instruction in different diagnosis in the particular case, and consultation with the intern as to the best method of treatment and what is expected from each item of treatment, should be a part of the daily rounds. All the interns coming from good medical colleges can and do when they first come to a hospital make good physical examinations and histories; but unless the visitant shows some interest in those written histories and examinations, commenting on them and criticizing them, the intern eventually feels that his efforts in this regard are not appreciated and are not used, and will slight this most important work.

Laboratory work should be encouraged in all cases in which it may be of any assistance, and the laboratory observations should be discussed together with the other data in the case, and their proper evaluation from the experience of the attendant should be emphasized.

The intern should be taught in detail and by personal example the proper care of accident work, and should himself be permitted, after instruction, to care for accident cases, his opportunities being gradually enlarged as he shows ability. He should himself reduce fractures under the eye of the visitant, and he should be required to keep the various dressings and appliances used in an accident service in proper position during their use, and explanation should be given to him of the results of failure so to do.

In entering on his obstetric service, the intern should be taught obstetrics and should not be expected simply to administer anesthetics to the patient while the visitant attends to the delivery. Practical experience in examinations, in the determination of position and in normal delivery is rightfully his. It should be his privilege to be assistant in abnormal deliveries.

In surgery, the intern should so far as possible and so far as is practical be first assistant to the operator. In this position he can see and he can learn. He will have an opportunity to develop

manual dexterity, which is requisite in a surgeon; he will learn to meet the emergencies which arise, and will be able to do some of the minor work in connection with the operation. As he develops dexterity and knowledge, he should be permitted to do some minor operating by himself and without the assistance but under the eye of the attending surgeon. Before he has completed his term of service of one year in the hospital, he should have done many minor and a few major operations, such as herniotomy, appendectomy, excision of external tumors and amputations. Having operated on the patient, he should then have the responsibility of the after-care with as little interference from the attending surgeon as possible. Managing the responsibility of a patient is quite as much the duty of the staff to teach as is the actual medical and surgical treatment of the case.

It is highly advisable, if not absolutely necessary, for the hospital to have residents as well as interns. Certainly, if the hospital is of sufficient size to furnish satisfactory clinical material for the education of the intern, it is large enough to need one or more residents. The relationship of the resident to the visitant is the same as that of the intern, except that it is more intimate and more confidential. He should be chosen by the staff, if possible from the outgoing class of interns. A fair indication of the success of an institution as a training school is found in the proportion of interns of the hospital who apply for residency in their own institutions. The resident must have more trust reposed in him, have more opportunities for practical work, and be more nearly the associate of the visitant than is the intern. He must not be asked to do the detailed drudgery that is expected of the intern, but it should be his duty to see that those duties are satisfactorily performed. He should be the superior officer of the intern, and should be so recognized by the staff of the hospital. He should make the rounds of the hospital with the attending physician and surgeon on whose service he is, together with the interns, and in addition he should make his own rounds with the interns at another hour of the day to supplement the work and the directions of the attending physician. He should be responsible for all of the cases in his service, and the visitant should support him in that responsibility to the patient, so that his contact will be only less intimate than that of the visitant himself. He should be given every facility possible to improve himself in practical work, for it must be remembered that in the case of the resident he has given one year to internship and is now giving one or perhaps two more years of the best part of his life to the service of the hospital, and for this he has a right to expect the best that the hospital and the staff can give him.

In addition to the strictly medical and surgical teaching which the intern obtains from the individual visitant, he should obtain other instructions, advice and suggestions that will be helpful to him in his work later on. In the medical school he is taught little of ethics and little of the medicolegal side of his profession. What he is taught is in the way of lectures and suppositious cases, but in the hospital the concrete case is before him, and it can well be used as an example to impress on him the ethical, social and legal phases that he will have to meet. The opportunity is present in many cases of guiding the young man in the medicolegal circumstances

that arise. Many cases of accident are court cases, and the intern or the resident must appear in court as a witness. In such cases he should be instructed before going to court as to the rights and privileges both of himself and of his patients. He can be taught how to answer questions and what to avoid in answering questions, so that he can give his testimony creditably to himself and to the profession.

Besides the responsibility of the individual staff member to the intern, the staff as a whole has obligations to its staff of interns. The staff of a hospital should not be a number of individuals each one going his own way, doing his own work in the hospital without attention to the work of others. There should be that spirit of mutual trust, helpfulness and interest which promotes the discussion of each one's cases with the others as they meet in the hospital, and to these discussions the interns that are at hand should be welcome. The discussion of cases by the members of the staff in this way amounts to a consultation on the particular case and a general review of cases of that type which is of inestimable benefit to the intern. He should be encouraged to make inquiries and offer suggestions along with his elders, and a spirit and practice such as this promotes a general medical permeation of the atmosphere out of which the staff men as well as the intern cannot fail to absorb much valuable medical knowledge. There should also be frequent consultations between the medical, surgical and other staffs on interesting cases.

The establishment of a weekly clinicopathologic conference is one of the most appreciated means of teaching the intern. The material for these conferences should be selected by the resident physicians or, in their absence, by that member of the staff in charge of interns. The case should be presented by the intern in whose care it has been, the essential points of the examination given, the laboratory and roentgen-ray observations detailed, and the progress noted. In the case of death, the autopsy data should be presented by the pathologist who made the autopsy. Discussion on the case should be free, friendly and critical, and should not be monopolized by the members of the visiting staff. In fact, it is well for the discussion to be participated in primarily by the interns before the more experienced visiting staff give their views. The knowledge that such cases are to come up for discussion and that the interns are expected to take part stimulates then in studying and informing themselves, and their participation in the discussion fixes the knowledge thus gained by study so that it is not soon forgotten. The grouping together thus in a conference of the general surgeons, internists, laboratory and roentgen-ray men, and the different specialists whose fields may be invaded by the disease or injury, gives a group picture not only to the intern but to all concerned, which is more valuable than the expression of any single man in connection with it. This type of conference is postgraduate instruction of the most valuable type in which all participants are teachers and all are pupils.

The medical and accident services of the hospital offer means for continuous and daily instruction in diagnosis as well as treatment that is not so easily obtained in the surgical service, where most of the time is devoted to operations and to the daily visits. For this reason, when the time available for instruction to the interns in diagnosis in the surgical service is insufficient, it should be the

practice of the surgeon on duty to devote regularly, at a certain time during the week, one or two hours to a surgical ward walk with the surgical intern staff for the distinct purpose of using the cases in the hospital that are suitable for it for bedside instruction in surgical diagnosis. At that time the surgeon can discuss with the interns the operation or the treatment that is advisable.

The monthly staff meeting, while more formal than the clinical conference and participated in by members of the visiting staff, it also an important feature in the instruction of the intern. It is not expected that the interns will take the same prominent part in these discussions that they do in the clinical conferences, but they should have the right and the opportunity to participate, so as to clarify in their own minds the ideas which they receive from the different speakers.

The policy of the hospital should be to obtain as large a proportion of autopsies as is possible, and the visiting staff can do much toward that end. Their support in obtaining autopsies is at times invaluable, and their attendance at them increases the interest of the interns and promotes more careful and efficient postmortem examinations. The discussion of the postmortem observations in relation to the symptoms and conditions developed during life is a most valuable factor in teaching the interpretation of symptoms, and the routine postmortem has the greatest tendency to develop careful diagnostic work.

One of the most essential means for discharging the obligations to the intern or giving him proper instruction is a library. If the hospital as an institution will not supply a library for the use of the interns, buying for it the new books that come out from time to time, and subscribing for a reasonable number of journals, it should be the pleasure as well as the duty of the staff to contribute a sufficient amount of money to supply that need. Much has been said and written lamenting the passage in our medical life of the beneficent influence of the old time preceptor. By assuming the obligation of the education of these young men in the practical details of the practice of medicine, the staff of the hospital has voluntarily taken on itself the function he previously assumed. The various duties herein enumerated are those that previously were accepted as his duties. How better can the duty of the staff to the intern be prescribed than to say, "The staff should be preceptor to the intern." That is its obligation, and the conscientious discharge of those duties by the members of the visiting staff will give the same satisfaction and pleasure as was experienced by the preceptor of old.

HOSPITAL'S FUNCTION IN MEDICAL EDUCATION

At the present time, altogether 317 hospitals are more or less related to medical schools in the training of physicians. There are now forty-nine hospitals which are both owned and controlled by medical schools, and thirty-seven in which, although separately owned, the entire clinical material is controlled by medical schools for teaching purposes; in forty hospitals, generous privileges are being utilized in the training of medical students; in sixty others, to an average degree, facilities are being used in medical education and, in 131 others, facilities are being used to a lesser extent. Of these hospitals, eighty-two are adjoining or in close proximity to the medical schools, the

others being from three blocks to four or five miles distant. There are probably a score or more of other hospitals to which medical students go occasionally for training in such limited branches as contagious diseases, tuberculosis, and nervous and mental diseases. With the securing of larger numbers of interns there has developed also, in the larger hospitals, particularly, the practice of selecting from among the interns those of special merit, who are retained for one or more years as residents, who devote all their time to either the medical or the surgical side of the hospital as house physicians or house surgeons. Some of these residents continue in the hospital for three or four years to perfect themselves further in the specialty chosen. Thus, through residencies in the specialties, which are being provided in a rapidly increasing number of hospitals, the educational function of hospitals is being developed in the field of graduate medical education.—N. P. COLWELL: *J. A. M. A.*, March 12, 1927.

EXCESS OF MEDICAL STUDENTS IN FRANCE

The excess of medical students in France, as in many other countries, is beginning to constitute a difficult problem. There are at present 5,000 students of medicine in Paris alone and 8,800 students in France as a whole. Among this number (in Paris, especially) there is a large proportion of foreigners. Theoretically, the foreign students, after securing their diplomas, are supposed to return to their own country to practice their profession. Foreign students, on entering French universities, are not always required to present the same evidence of preparatory studies that is exacted of French students. By reason of this fact, foreign students receive a special diploma, which does not permit them to practice in France. But most foreign students, through their ambassador, try to get this restriction removed, in order, as they allege, that they may treat their compatriots residing in France. However, they seldom locate in the regions in which the number of their countrymen is especially large but remain in Paris, where, in the opinion of the medical societies, they constitute an encumberment, as the capital is overcrowded with physicians, while the rural districts complain of a dearth.

It is alleged that the encumberment is felt also in the schools and hospitals. Professor Houssay has recently recommended limitation of the number of students to be admitted to each medical school (whether Frenchmen or foreigners), as is being done in many other countries. He holds that greater severity in examinations is not advisable. The French medical faculties do not grant a doctor's diploma to more than 30 per cent of the students, and those who fail are inclined to become fomenters of discord. Houssay believes it would be better to confer the doctor's degree on a larger percentage of students, and to control matters by placing more restrictions on admission to the study of medicine.

Professor Roger complains that most of the present-day students look on medicine as a lucrative profession in spite of the many attempts to inform them to the contrary. Consequently, they complete their studies in as short a time as possible, most of them failing to develop the proper interest in purely scientific researches. They plead as an excuse that the cost of living in Paris

is high and that the expense of medical study is burdensome. It is difficult to find advanced students to serve as assistants in the laboratories or as preparators for demonstration courses because they think that such work means just so much time lost. Another reason is that the remuneration for such service is inadequate. Professor Roger thinks the remedy lies in the creation of scholarships, placed at the disposal of the dean, to be used in aid of good students without adequate resources. — PARIS LETTER, *Jour. A. M. A.*, March 19, 1927.

USE OF MOTION PICTURES IN TEACHING

In 1925, we completed the construction of a series of motion pictures dealing with rectal diseases and their treatment. This series was built up from motion pictures of actual cases which had come under observation during a period of eleven years. These various motion picture "shots" were grouped according to the disease they portrayed. Next motion pictures were made of all the surgical operations which rectal surgeons employ, as well as the various medical treatments, such as injection treatment of hemorrhoids and the nonsurgical treatment of rectal stricture. However, although the surgical operations or medical treatments were perfectly and clearly shown, and in a manner far superior to what could be possibly viewed by a student observer at a clinic, the fact remained that the mind seemed to be looking for some additional help in understanding the exact process of the technic. The answer to this was found in the employment of animated cartoons or diagrams. By preceding an actual showing of the surgical operations with an animated diagram of what was to take place, the ideal appears to have been found. At the present time the entire series of films aggregate about 55,000 feet, constituting a thoroughly organized and correlated fund of knowledge on the subject of rectal diseases which is made easily and instantly available to any medical student. Instead of being under the necessity, as heretofore, of lumbering from one clinic to another seeing the cases that happen to come in, and in the meantime obtaining a very haphazard impression of widely varying clinical conditions, the student may now make an intensive and thorough study of each subject in the field of rectal diseases. Not only may he see the actual conditions, but he may also see the same patient operated on, dressed from day to day, and finally see the final result, all in the brief time required to show the motion pictures.

Motion pictures have also been made of the interior of certain portions of the intestinal tract. The dissection of an entire human body is shown in faithful detail in a little over an hour. Moreover, without the necessity of again going through the dissection, the process may be shown repeatedly until the student is entirely familiar with its detail. In this way, from the seat of a comfortable chair in the lecture hall he may learn what otherwise would require months of messy work on a malodorous cadaver. Thus, through the agency of motion pictures, the anatomy and physiology of the body in health, the characteristic appearance of cases of disease, and each step in the plan of its treatment may be presented. If a student is slow to grasp, the pictures may be run twice or more times. If an interesting phase is observed, the pic-

ture may be stopped and started again as soon as it has been sufficiently observed. Finally, in this series of pictures there are to be observed all the interesting intestinal and rectal cases that have come through Bellevue Hospital in the last nine years. Where else can a nine year clinic such as this be viewed in a little over an hour?

Aside from the immense economy of time and effort, the particular features by reason of which the employment of the motion picture film is most especially adapted to the teaching of medical subjects, are its ready accessibility and its permanency of form. It is a practically indestructible record which may be used time and time again without any more exertion than the printing of new positives from the original negatives. The clearness and simplicity of the motion picture portrayal of a clinical condition stands in direct contrast to the totally inadequate view that a medical student can obtain from a seat in the amphitheatre. Perhaps, the most important virtue in the method lies in that extensive flexibility which permits constant additions, corrections, or subtractions, and which makes it possible to keep the record constantly up to date and complete to the utmost. Moreover, the same flexibility permits the rearrangement of material assembled so that it may be correlated along the lines of a logical presentation of the facts on each and every subject.—J. F. MONTAGUE, *New York State J. M.*, Feb. 15, 1927, p. 176.

MEDICAL ETHICS

The majority of the regulations of the medical profession can be traced to their close connection with the old English system of apprenticeship, from which has evolved the code which governs the conduct of medical men in their relationship with each other. The patient is the primary reason for the doctor's being, but to the patient the questions of medical etiquette occasionally appear well nigh as difficult of understanding as were the metaphysics of the Middle Ages; professional etiquette, however, be it legal or medical, is but one of the many conventional practices which lie at the roots of the greatest of all conventions, civilization itself. That even well-informed authorities can be led into error on questions of medical ethics is evident from two serious misstatements in the text of a recent publication by two distinguished lawyers. The book is remarkable alike for its clarity of exposition of a difficult subject and for the sympathetic view which the authors have taken of the medical man's legal difficulties. But the learned counsel are in error in stating that "it is considered advertising to write signed articles in lay papers"; nor does the General Medical Council ever "make exceptions in case of eminent members of the profession who have been permitted to write in the newspapers, while less eminent members have been struck off the register for doing exactly the same thing." Neither is it "contrary to etiquette," on the occasion of a medical consultation to inform the patient that there is disagreement between the consultants, where such exists. Medical ethics are but the professional application of the golden rule. The medical man's first duty is to his patient; to him he must give fully and honestly of his knowledge. His second duty is to himself, his third to his professional brethren. Over and above all these stands his duty to society as such. ED.: *Irish J. Med. Sci.*, March, 1927.

THE DUKE FOUNDATION

December 11, 1924, Mr. Duke signed the trust indenture. The deed of trust set aside $40,000,000 to be expended as follows: $6,000,000 for the construction of a university to be named for his father. That left $34,000,000, and he provided that 20 per cent of the income on that principal should be added to the principal every year until the total trust fund amounted to $80,000,000. It is believed that this will come about in the course of thirty or thirty-five years. Then the balance of the income, 80 per cent of the income on the trust funds, he left as follows: 32 per cent for Duke University, 32 per cent for hospitals, 10 per cent for orphanages, 5 per cent for Davidson College, 5 per cent for Furman University, 4 per cent for Johnson C. Smith University, 6 per cent for the building of rural Methodist Churches, 4 per cent for the maintenance of rural Methodist Churches, and 2 per cent for superannuated Methodist ministers. October 10, 1925, Mr. Duke died. In his will he added to the trust established the year before. The will set aside one-third of his estate for his daughter and about $2,400,000 for his kith and kin, and then provided that $7,000,000 should be made available as an additional construction fund for Duke University; that $10,000,000 should be used to establish a medical department at Duke University, $4,000,000 for the construction of the medical department, and $6,000,000 for its endowment. The will then set aside a sufficient amount to give Mrs. Duke an annuity of $100,000 a year during her lifetime, that sum to revert at her death to the Duke Endowment. The balance of the estate was to go into the trust fund and the income from 10 per cent of it was to go to the University and the income from the other 90 per cent to the support of hospitals. It will not be known until the end of this year just how large the estate is and how much the addition by will to the trust amounts to, but it is conservatively estimated that when the provisions of the will are added to those of the trust the endowment will be somewhere in the neighborhood of from $75,000,000 to $80,000,000. With the addition of the 20 per cent of income from the original trust funds of $40,000,000 added to the principal until the $40,000,000 given by deed of trust amounts to $80,000,000, the total endowment, in the course of twenty-five or thirty years, should run considerably over $100,000,000.

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In considering medical services, it is important that we think of all three divisions or essential parts of medical service, namely: doctors, nurses, hospitals. Adequate medical facilities or hospitals enable a population group to receive sufficient medical attention from a limited number of physicians who, without facilities, would be entirely inadequate to deal with the community problem. If we do away with medical facilities, we must multiply medical personnel. If we provide medical facilities, we may cut down medical personnel. Let us look at the problem in another way. A county has 30,000 people taken care of by twenty physicians. The average physician costs the community, that is, is paid by the community, $5,000. This means that the community pays $100,000 to the twenty physicians, and this estimate does not include drugs and nursing. The community or county has no hospital. Now suppose a hospital is built. The county with a hospital is in far better shape, from a medical standpoint, with twelve

physicians than it is without a hospital and with twenty physicians. The potential saving of $5,000 each for eight physicians, a total saving of $40,000 a year, will more than enable that county both to build and maintain a hospital.

* * *

In cities of 100,000 and over, there is one physician for every 536 people; in cities of between 50,000 and 100,000, there is one physician for 628 people; in cities of between 25,000 and 50,000, one physician for 647 people; in cities of between 10,000 and 25,000, one physician for 721 people. In and about towns of 1,000 and less, that is, typical rural sections where 32.5 per cent of the people of the United States live, there is one physician for 1,238 people. This means that there are nearly two and a half times more physicians in the larger centers of population than in the rural sections of this country.

* * *

In sixty-eight cities of the United States with a population in excess of 100,000 there is an average of twenty-two hospitals. In seventy-six cities of the United States with a population of between 50,000 and 100,000 there is an average of six hospitals. In 143 cities of the United States with a population of between 25,000 and 50,000 there is an average of 3.7 hospitals. In 459 cities of the United States with a population of between 10,000 and 25,000 there is an average of 2.1 hospitals. In the 14,946 towns and villages of the United States with populations under 10,000 there is an average of .22 of a hospital, or only one hospital in five such places. It is apparent that both medical personnel and medical facilities are concentrated in urban areas with a corresponding depletion of rural sections.

Hospitals have developed step by step with the advances of medical science. In 1873 there were only 149 hospitals in the United States; in 1900 there were approximately 2,000 hospitals in the United States; in 1925 there were 6,896 hospitals in the United States.

* * *

As to the provisions of The Duke Endowment for the improvement of rural medical services: in the first place, The Duke Endowment cannot assist individual patients or individual physicians. The Trustees of The Duke Endowment can assist communities, communities that, recognizing the problem of sickness in its larger and more important dimensions and seeing in it a real community responsibility, a responsibility too large and too important to be imposed upon fifteen or twenty physicians, assumes its part and accepts the care of the sick as a community duty. The Trustees of The Duke Endowment can go with a community but not without the community to the relief of their sick. This, in my judgment, is the most fundamental and most important provision of the trust for assisting the sick. The Duke Endowment may assist but never relieve a town or community of its high and sacred obligation to its sick and suffering. In the second place, we can assist a community in the care of its sick to the extent of one dollar for every day a bed is occupied by a patient who is unable to pay and who is treated free of charge. If a community has no charity problem, if everyone is amply able to pay for their hospital care, such a community does not need the help of The Duke Endowment. On the other hand, if a community has a charity problem but it will neither recognize nor accept its obligation, it does not deserve the help of The Duke En-

dowment. But if a community has a charity problem and recognizes and accepts its obligation, to the extent of the acceptance of its burden, The Duke Endowment will help. For example, if there are five charity cases to be cared for, The Duke Endowment will give five dollars a day; if ten, ten dollars a day; if twenty-five, twenty-five dollars a day. In proportion to the need, the gift applies. In the third place, it is provided that after a dollar for every free bed day's work in the hospitals of North Carolina and South Carolina has been provided, and if there is a surplus, the surplus may be used in assisting communities to build and equip hospitals. Ordinarily the trustees will have available from $700,000 and upwards, the sum accruing each year, for assisting hospitals. This will mean about $400,000 for maintenance and about $300,000 for construction and equipment.—W. S. RANKIN: *Southern M. J.*, March, 1927.

PROBLEMS OF MEDICAL EDUCATION

One of the problems of physicians today is premedical training. I find that many colleges are rebelling against the premedical courses. They feel that demands are being made on them for premedical work with which they are not sympathetic. I speak now from the college standpoint. I do not believe the college is giving the best material for the medical schools, and it will take careful, thoughtful study from men both in the medical profession and men in the colleges to solve the problem. So far there is little cooperation between the medical schools and the premedical instructors. I find, as I go here and there, very much opposition to the demands that are made upon the liberal arts colleges. Not only the medical schools but all the other professional schools are demanding two or more years of preprofessional training in the college, and these demands are proving burdensome. Those who are interested in medical education should sit down beside the men giving premedical courses and work out a satisfactory solution for getting a better product for the medical schools.

The preclinical men and the clinicians are not working closely enough together. The freshman has so much to memorize that he has very little time for thinking. The thinking may be crude, to be sure, but it would be worth while to cut down a little some of the many demands upon them in order to give them this opportunity. Here is my suggestion for the future: let the state establish in strategic centers hospitals for the surrounding communities. In a town of some size, strategically located, build a hospital and make it a medical center for a county, or larger district, as the case may demand. Then encourage young physicians to go to these centers. I do not believe in the state's doing too much for the physician, but it should see that hospitals are run efficiently. Then women should be trained to handle these territories as district nurses, using the hospital as the center of their activities. It is not a question of having enough physicians, but it is a question of distribution of them. H. W. Cox: *Southern M. J.*, March, 1927.

TEACHING MEDICAL STUDENTS THE NORMAL BODY

How common it is to find the family physician utterly at sea with reference to topography. It is not unusual to hear

him discussing pneumonia in the middle lobe posteriorly or to find him relying almost entirely on auscultation to determine cardiac conditions. In the latter case, his eyes have never learned to visualize normal cardiac behavior; consequently they are not quick to perceive departures from the normal. His fingers are not on intimate terms with the normal heart action and position, and as a result they are not sufficiently educated to detect variations from the normal. He carries no definite mental picture of cardiac topography; therefore, percussion for him is haphazard even at best. He resorts to auscultation, because heart murmurs are readily thrust upon the ear. Evidently he was not taught the importance of employing in routine orderly fashion, the fundamental methods of examination. We naturally conclude that he has never experienced the satisfaction of knowing the normal and that he can hardly hope to enjoy the thrill that accompanies the power to detect slight deviations from the normal. In response to letters addressed to the deans of seventy-nine medical schools in the United States, fifty-six replies have been received. A study of these letters indicates that forty-three of the fifty-six schools are giving a special course on the normal body. With two or three exceptions, the course is given in the sophomore year. Thirteen of the schools are not giving a special course but combining the study of the normal and abnormal in the general course on physical diagnosis. Thirty-eight of the forty-three schools giving a special course on the normal body stated the number of hours devoted to the course. The time ranged from six to seventy-two hours, with an average of forty-two. Some of the schools devoting only a few hours to this special course deemed it wise to contrast the normal with the abnormal and have set apart more time for the course on physical diagnosis. This comment was also found in some of the letters from schools having no special course on the normal. However, the results of the correspondence would indicate that on the whole the schools carrying the special course for the study of the normal body are impressed with its importance and pleased with the results. What then can be done to interest the medical student in the study of the normal body and to inspire him with a desire for clinical accomplishment? In many schools the practical work on the normal body is delegated to young men who, for want of experience, are not prepared to speak with authority on the question of normal variations, and who, even though of unquestioned ability, may not be able to hold interest and inspire confidence. In choosing teachers for this course, it should be remembered that it is often more difficult to determine that an organ is normal than it is to recognize the presence of disease. The teacher should be an experienced clinician, thoroughly familiar with the practice of the fundamental methods of examination, and so skilled in their application as to be able to prove their efficacy in determining position, structure, relationship and alteration in the function of tissues and organs. Mechanical aids and laboratory tests should be employed when possible to prove physical findings. For example, if the heart is outlined by percussion and surface markings are established, the student will be greatly interested in the roentgen-ray examination for confirmation. If results with the two methods correspond, he will be encouraged to go on with the cultivation

of his special senses. If he can be made to see that the acquisition of valuable diagnostic power ultimately comes through faithful practice, he will make the most of every opportunity. The pupil may be further interested and inspired by frequent biographical references to the history of clinical medicine. L. J. MOORMAN: *Southern M. J.*, March, 1927.

PLACE OF PREVENTIVE MEDICINE IN THE MEDICAL SCHOOL

Contact between a department of preventive medicine and public health and the medical school, as well as the relation it may sustain to the university at large, will prove indispensable in providing the much needed personnel for specialized health service. I do not favor the so-called lecture course in hygiene and public health which in the past has been the usual practice in the majority of schools—a didactic course chiefly dealing with the laws and regulations for the correction of nuisances and the enforcement of quarantine, with some consideration of communicable diseases, water supplies and sewage disposal. Regular instruction in this subject cannot be done effectively without bringing the student into more intimate contact with the practical problems of public health organization and administrative practice, including the application of the principles of epidemiology and immunology in the control of disease. The teaching of this subject must pass from the realm of theory into the field of practice. There should be in every medical school, administered chiefly by an all-time personnel, a department of preventive medicine and public health maintaining university standards in scope and in ideals. Any plan of teaching the principles of hygiene and public health will prove disappointing in an effort to permeate the curriculum with the spirit and methods of preventive medicine, unless headed up in a well administered and efficient department with adequate personnel and equipment for teaching and research.

The Association of American Medical Colleges has specified that the time allowed preventive medicine and public health in the curriculum should be from 3 to 4 per cent of the total hours required. On the basis of a 4,000 hour curriculum, the minimum and maximum time would be from 120 to 160 hours. It is clear that it is not necessary to increase this time to give the regular course in this subject, but that such realinements should be made as will give added emphasis or altered proportion to the idea of preventive medicine throughout the curriculum, and also will afford opportunity for elective work, as is done in other subjects, for students who may feel that they could take such courses with profit.

The factors involved in developing a scheme of instruction in preventive medicine and public health adapted to medical students are:

1. A regular course of instruction, preferably during the fourth year, consisting of lectures and field demonstrations, with the laboratory exercises involved in teaching the application of principles of epidemiology in the prevention and control of disease.

2. The coordination of this course with activities of official health agencies carried on in the community and surrounding territory.

3. Special correlation of instruction in the department of preventive medicine and public health with the course in bacteriology.

4. Coordination of the work of the department with a limited number of clinics on infectious, dietary and occupational diseases in the department of medicine.

5. Cooperation of the departments of the medical school in teaching the principles of preventive medicine throughout the medical curriculum.

6. Assignment of special problems in public health to students for study in the community. The reports, when deemed desirable, are discussed in class conference.

7. Making a sanitary survey of a definite area in the community, or of a small town or city.

At Vanderbilt University the regular course for fourth year medical students consists of forty-four lectures and recitations and sixty-six hours of laboratory work and field demonstrations, a total of 110 hours. The discussions in the class consist of a rather comprehensive consideration of the etiology, modes of transmission, and methods of prevention and control of communicable diseases. Deficiency diseases are likewise emphasized, and some attention is given to occupational hazards, including the etiology, symptomatology, diagnosis and prevention of plumbism. The discussion of the diagnosis and treatment of disease is given only with specific reference to control measures. The subject matter of the course is presented with a view to making it of definite value to the medical student as a prospective practitioner of medicine.

The field demonstrations for medical students are made possible through cooperation and coordination with the state and local health agencies. These demonstrations require a study of the state department and its bureaus, the municipal health service, and constituent activities, such as prenatal and well-baby clinics, pasteurization of milk, inspection of dairies, laboratory examination of milk and water, sewage disposal, local water supply, tuberculosis sanatoriums, including control measures, the problem of the feebleminded, and venereal disease control. The students are also afforded an opportunity to visit and study a county health unit, the methods used in its establishment, the securing of funds, the budget, the personnel, the activities, and the essential methods employed, and to make some analysis of the results obtained in relation to local conditions. This study is directed with particular reference to the contacts which a local health department makes with the practicing physician, and the contribution which he in turn may make toward its success in a district or county. Not less than seven lectures are given by the head of the department of preventive medicine and public health on the epidemiological aspects of certain diseases or diseases representing groups of organisms which are studied in the course in bacteriology. Lectures are given as concluding discussions cognate with laboratory studies on such subjects as: (*a*) some essential points in the scheme of public health; (*b*) diphtheria from a public health standpoint; (*c*) the principles involved in the control of tuberculosis; (*d*) epidemiology of influenza; (*e*) meningitis; (*f*) essential factors in the control of typhoid, and (*g*) general considerations in the prevention and eradication of communicable diseases. In turn, the bacteriologist has agreed to give a certain number of laboratory exercises on water and milk as a part of the practical work in preventive medicine. During the clinical period for the third and fourth year students, the head of the

department of medicine after a clinical discussion of certain preventable diseases has agreed that some consideration be at the same time given by a representative of the department of preventive medicine to the measures involved in prevention and control. Combined clinics have been conducted by the departments of medicine and preventive medicine and public health on subjects such as typhoid, malaria, and lead poisoning. The department of preventive medicine and public health, in collaboration with the heads of other departments in the medical school, is endeavoring to prepare an outline which will be used as a basis for stressing the prevention of disease in the respective courses. W. S. LEATHERS: *Jour. Am. Med. Assn.*, March 26, 1927.

CARE OF PATIENT

FRANCIS W. PEABODY, Boston (*Jour. A. M. A.*, March 19, 1927), says that the most common criticism made at present by older practitioners is that young graduates have been taught a great deal about the mechanism of disease, but very little about the practice of medicine—or, to put it more bluntly, they are too "scientific" and do not know how to take care of patients. To begin with, Peabody continues, the fact must be accepted that one cannot expect to become a skilful practitioner of medicine in the four or five years allotted to the medical curriculum. All that the medical school can hope to do is to supply the foundations on which to build. Good practice presupposes an understanding of the sciences which contribute to the structure of modern medicine, but it is obvious that sound professional training should include a much broader equipment. The teacher who is attempting to train medical students is immediately confronted by the fact that, even if he would, he cannot make the conditions under which he has to teach clinical medicine exactly similar to those of actual practice. The primary difficulty is that instruction has to be carried out largely in the wards and dispensaries of hospitals rather than in the patient's home and the physician's office. One of the chief differences between private practice and hospital practice is that the latter always tends to become impersonal. The treatment of a disease may be entirely impersonal; the care of a patient must be completely personal. Hospitals, like other institutions founded with the highest human ideals, are apt to deteriorate into dehumanized machines, and even the physician who has the patient's welfare most at heart finds that pressure of work forces him to give most of his attention to the critically sick and to those whose diseases are a menace to the public health. Moreover, the circumstances under which the physician sees the patient are not wholly favorable to the establishment of the intimate personal relationship that exists in private practice, for one of the outstanding features of hospitalization is that it completely removes the patient from his accustomed environment.

What is spoken of as a "clinical picture" is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes and fears. When a patient enters a hospital, one of the first things that commonly happens to him is that he loses his personal identity. He is generally referred to, not as Henry Jones, but as "that case of mitral stenosis in the second bed on the left." The disease is treated,

but Henry Jones, lying awake nights while he worries about his wife and children, represents a problem that is much more complex than the pathologic physiology of mitral stenosis, and he is apt to improve very slowly unless a discerning intern happens to discover why it is that even large doses of digitalis fail to slow his heart rate. An understanding physician who tries to make the situation clear to him, and then gets the social service worker to find a suitable occupation, does more to straighten him out than a book full of drugs and diets. But if teachers and students are liable to take a limited point of view even toward interesting cases of organic disease, they fall into much more serious error in their attitude toward a large group of patients who do not show objective, organic pathologic conditions, and who are generally spoken of as having "nothing the matter with them." They are all characterized by the presence of symptoms that cannot be accounted for by organic disease, and they are all liable to be told that they have "nothing the matter" with them. Medically speaking, they are not serious cases as regards prospective death, but they are often extremely serious as regards prospective life. Their symptoms will rarely prove fatal, but their lives will be long and miserable, and they may end by nearly exhausting their families and friends. Death is not the worst thing in the world, and to help a man to a happy and useful career may be more of a service than the saving of life. Technically, most of these patients come under the broad heading of the "psychoneuroses"; but for practical purposes many of them may be regarded as patients whose subjective symptoms are due to disturbances of the physiologic activity of one or more organs or symptoms. The ultimate causes of these disturbances are to be found, not in any gross structural changes in the organs involved, but rather in nervous influences emanating from the emotional or intellectual life, which, directly or indirectly, affect in one way or another organs that are under either voluntary or involuntary control. The physician who does take these cases seriously—one might say scientifically—has the great satisfaction of seeing some of his patients get well, not as the result of drugs or as the result of the disease having run its course, but as the result of his own individual efforts. If students are to obtain any insight into this field of medicine, they must also be given opportunities to build up the same type of personal relationship with their patients. Disease in man is never exactly the same as disease in an experimental animal, for in man the disease at once affects and is affected by what we call the emotional life. Thus, the physician who attempts to take care of a patient while he neglects this factor is as unscientific as the investigator who neglects to control all the conditions that may affect his experiment. One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient.

THE TEACHING HOSPITAL

The staff of a teaching hospital enjoys a distinct advantage in that the university spirit tends to maintain a more evident uniformity in the personnel. Meetings to coordinate teaching methods are a matter of course, and the stimulus of teaching has tended to attract and hold together a type of

physician more interested in the scientific advance of medicine than is the case in the nonteaching hospital. This has been reflected in a higher class of interne service, and while the patient is used for teaching purposes, still his treatment is more effective than in the general run of nonteaching hospitals. Teaching has also made for a greater continuity of policy, a certain permanence of the institution, which is not so obvious where the cohesive force of the university is lacking. In other words, members of such a staff have the benefit of an environment which maintains their contact with the progress of medical knowledge. The teaching hospital, however, is now being faced by a new problem. Many of these institutions are becoming so large that the staff required for the proper care of the wards and dispensary must of necessity include many who, while excellent clinicians, are not suited to act as instructors. On the other hand, an increasing number of medical schools are restricting the number of undergraduates. In other words, the staff of instructors has increased out of all proportion to the number of students. In the past, hospital appointments have carried with them, almost automatically, a position on the university staff, but there is some doubt as to the efficiency of this arrangement. Would it not be an advantage to split the present staff into two groups? (1) those whose ability as teachers could be used better for more instruction, with a relief from the more burdensome features of hospital routine; and (2) those whose interests in practice could be advanced by a nonteaching position in the hospital dispensary. They would then have the advantage of hospital affiliation without being burdened by a task for which they are not fitted and for which they have but little enthusiasm. From the teaching point of view, such a policy would add greatly to efficiency, and while the instructors would have more hours of work, still the added prestige of a university appointment would do much to offset the inconvenience of the extra labor involved. The disadvantage lies in the removal of a considerable number of the hospital staff from the stimulating influence of teaching, with the consequent addition of these men to the nonteaching element. D. S. Lewis: *Am. Clin. Med.*, February, 1927.

THE MEDICAL CURRICULUM

No one knows just how much anatomy, how much physiology, how much medicine, how much surgery is best for the average student. Everyone knows that the amount best for one student might not be the best amount for another student. Everyone recognizes the tendency of every teacher to overemphasize his own branch and teach too much detail. Everyone knows that these divisions of knowledge are arbitrary and overlapping and that what a student fails to get in one place he may pick up in another. I have only one obsession and that is to keep the required or assigned hours of each department as low as possible and permit the student as free an election as a fearless juggling of rules will permit. There has been a growing feeling among American faculties that the rigid division of the curriculum into two years of science and two years of clinical training is a mistake. This feeling is reflected in the almost universal introduction of physical diagnosis in the second year, with, in some cases, introductory clinics or lectures in medicine and surgery, and even elementary clin-

ics in the freshman year. A good many American educators believe that our curriculum is too rigid and that the student has too little responsibility as to the subject matter and order of his education. I am firmly of this belief and have dubbed our system the grooved rail method of education. Our students are so restricted by the class system, sequence, prerequisites and a filled schedule of required hours that they have no choice but to go forward or be run over. Here at Minnesota we have done a good deal to break up the military alignment and our schedules are much less rigid than in most American medical schools. We began twelve years ago by shortening our required courses and introducing electives in the sophomore and junior years. Tuesday and Thursday afternoons are supposed to be free from required courses and at this time are scheduled a fair number of advanced and special courses. It is hard to get students to take elective work as seriously as they do the more lengthy required courses, but here at least the students have a choice as to what they will do and that means a personal responsibility. A fair number become interested in one or another department, discontinue their medical work three or more quarters and get a master's degree. Our close association with the graduate school fosters this wholesome movement. A few go on to a Ph. D. The fellowship system helps, and so does the summer quarter. I do feel that we might well shorten our required courses still further and offer still more time for electives. At Minnesota we have had for two years an "Honors Course" with maximum freedom of election. No one as yet has elected this course. LYON, E. P.: *Minnesota Med.*, February, 1927.

RESEARCH IN MEDICAL SCHOOLS

Medical schools, as they are organized today, have three functions: There is first their original purpose of training practitioners of medicine. Second, as professional schools, they must perpetuate themselves by training their own teachers. Third, they must carry their share of the progress of medical science in laboratory and hospital not only through the work of their own teachers but also by training those who are to carry on investigation in research institutes. The student with exceptional bent toward research should be encouraged to undertake a problem during the medical course. If an occasional student has an interest so exclusively limited to some problem that he can not also carry the course, he can readily work for the degree of doctor of philosophy in the medical sciences and thus limit the amount of general work to the minors required for that degree. It is entirely feasible to train every single student in a medical school in the methods of descriptive science; but medicine has passed far beyond the stage of descriptive science, it is now in the experimental phase and the need of the medical school of today is to furnish a certain number of professional research workers in experimental medicine. This is the problem of our day; the problem of changing medical education from an art to a science was attacked thirty years ago when the laboratories became so dominant, but today it is the need of medicine as an experimental science that must occupy educational thought. Medical schools must now train physicians to carry out the ever-advancing methods of medical science and to increase the knowledge of the control of disease.

In my opinion the major factor in finding those who will undertake experimental research is the intellectual quality of the teacher. To select or accept the right students, to choose feasible problems, to direct students so as to retain their interest, to use all their originality, to smooth out their difficulties to some extent, yet not too much, is the most fascinating task of all teaching. The measure of its success is the measure of the progress of experimental medicine. The selection of a problem for a student needs nice judgment. It should be a task, in the first place, which is feasible. Secondly, though the instructor is convinced that the problem can be solved, it must offer some chance for the student's own initiative, must give him some play of ideas; it should involve the preparation of specimens, of the performance of experiments which he can carry out himself so that he can be gaining the concept of the essentials of experimental science, which are the formulation of ideas, the development of plans to put them to the test, and then observation, records and analysis. Thirdly, an ideal problem for a student must open up a field for him for further work so that he will get the best thing out of research, a training in a concept of knowledge as a growing thing.

The advantages to the student of solving a problem during his medical course are threefold. First, he receives valuable training and gains a new standard of work. Second, it enables the student to analyze his own abilities and tendencies from his actual experience. Third, it opens to him the door of opportunity in case he finds that he is actually interested in research and teaching. From the standpoint of the development of medical science, a school that gives no opportunity for students to start in research is not carrying the full load of the modern university. It will not be the method that will be the decisive factor but the individual teacher; given a Ludwig, a Mall or a Welch on the faculty, the question of research will take care of itself. Find the teacher with the gift for stimulating students toward research and give him freedom; he will determine his own method. F. R. SABIN: *Science*, April 1, 1927.

MEDICAL EDUCATION FOR GENERAL PRACTITIONER

It has been said, and William J. Mayo believes justly, that one should go to the educator for information but not for advice. This is especially true in medical education. The actual practice of medicine must be taught by example as well as by precept. The chief difference between the medical schools of the early eighties and the medical schools of today is that the teachers in the older schools were proud to practice medicine. They counted wisdom, that is, the application of knowledge, as being of greater importance than the mere accumulation of knowledge. Today one may say truthfully that medical researches designed to relieve generations yet unborn are looked on as being almost holy in conception, whereas the relief of people who are now miserable and suffering is too often looked on as rather sordid and commercial. In the old-time medical schools, students were inspired by the example of the heads of the clinical departments of medicine and surgery to learn to practice medicine for the relief they might give to suffering humanity. The teaching of medicine in the years from 1880 to 1883 was simple; there was not so much known as now. Today we are suffering from too much knowledge too widely diffused.

We try to teach our medical students something of all the medical sciences. We devote too much effort to driving home detailed information and too little to the development of perspective. None of us would pretend to a complete knowledge of even one subject, and yet we work our medical students seven days in the week to give them a smattering of everything. Many of them, in trying to achieve the impossible, are burned out mentally before they finish school. The detailed information we try so hard to give the medical student all can be obtained from books. We should teach him how to think and where to look for information, so that commencement will be what the term implies, the beginning of the study of medicine, rather than a consummation for medical practice. Inequality in the standards of professors in our medical schools has an effect on medical education. Certain professors are rigorous in their examinations, whereas others apparently are more considerate of the student, more in sympathy with his hard lot. Such differences unbalance the curriculum. The men who have the reputation of "plucking" students get more time from the students, regardless of the importance of the subjects they teach, than those who are apparently more lenient. The result, in many instances, is that essential subjects are neglected to emphasize the less essential. There is a tendency to make the profession of medicine an aristocracy. The cost of medical education, the number of years before men can be self-supporting, the age at which students graduate, averaging around 27 years, is driving many bright men into other professions. Yet investigation has shown that the student who graduates before he is 25 is of greater average professional worth at the end of fifteen years than the one who graduates after 25, and it has been said that those who rank in the second half in scholastic attainments at a medical college are on an average of as great professional value as the first half at the end of fifteen years. Mayo says: "Sometimes as I look over the requirements of our premedical and medical courses and talk with the professors I get a rather uncomfortable feeling that a possible object of some of the requirements, especially the so-called honor points, of the premedical course is to bring the classes down to the comparatively small number that can be conveniently taught. And yet we have great buildings, with expensive equipment, working comparatively few hours a day." The state is interested in the medical schools. For each dollar that is paid by the medical student, the state directly or through endowment funds pays from two to three dollars or more. This expense on the people of the nation is borne willingly in the hope of securing competent help for the care of the sick. If a student is unnecessarily delayed in his medical course for a year by lack of credits, he on his part and the state on its part are put to undue expense. And when one analyzes the reason for refusing this student admission to the medical school, it is sometimes seen that he would have been permitted to enter other departments of the university and that his lack of credits was too often in subjects that had really little to do with the practice of medicine. The function of the medical school is to turn out general practitioners, and the man who desires to take up a specialty should take it up as a graduate subject. The practice of medicine is changing, however, and the wealth of specialized knowledge available makes the independent general practitioner of the old times obsolete. Mayo does not advocate a letting down of standards in medical

schools, but he is convinced that one year of time could be saved in grammar schools and a year could be saved in medical schools by the four-quarter system. That children in the growing age have three months' vacation in the summer is no reason that young men and women at the height of their physical vigor, in a world on a twelve months' working basis, should have three months' vacation. Finally, the function of the medical schools is to turn out efficient general practitioners. To train specialists and research workers requires a long apprenticeship in graduate instruction under competent teachers.—*Jour. A. M. A.*, April 30, 1927.

TAKING MEDICAL EDUCATION TO PRACTITIONER

Charles A. Gordon discusses what he terms "taking medical education to the practitioner." The Medical Society of the State of New York is offering graduate education, without cost, to every physician in the state, whether a member of his county society or not. Fees are not charged, and county societies have not contributed funds for the work; the cost is met entirely by the Medical Society of the State of New York and the state department of health, which has borne most of the cost of the lectures in obstetrics and pediatrics. Lectures and demonstrations, clinical as far as possible, have been given in fifty-one of the sixty-two counties of the state; twenty-six counties have had pediatrics; twenty-three, obstetrics, and eleven, both, while fifteen others have had courses of another kind while this work was in progress. Gastro-enterology and general medicine, especially cardiac diseases and hypertension, have been very much in demand. For the most part, these lectures are scheduled to run from one to two hours on the same day and hour each week for six successive weeks. Each county, however, may have as many lectures as it wants. The actual work of teaching has been done by from fifty to sixty men from the larger cities of the state, who receive for their service the thanks of the committee, traveling expenses, and a small honorarium. When possible, courses are arranged in adjoining counties, so that lecturers may cover more than one county in the same day, lecturing both afternoon and evening. The work of organization is in the hands of the Committee on Public Health and Medical Education, with an office in the library building of the Medical Society of the County of Kings. The Medical Society of the County of Kings and the Long Island College Hospital are cooperating in a comprehensive plan, which grew out of the Practical Lecture Series—a course consisting of twenty clinical lectures and charts, specimens, and demonstrations on patients, given in the spring and fall on Fridays at 5 o'clock. Every physician in Brooklyn receives an announcement the day before the lecture. This is not the stereotyped medical meeting; papers are not read; discussion in the usual sense is not permitted, and only tried teachers lecture on subjects selected by a committee. Lectures start promptly at 5 o'clock and end at 6 exactly, so as not to interfere with the day's work or with evening office hours. More than a hundred lectures have been given; yet the series is as popular as ever, the auditorium always being crowded to capacity, with an audience that changes from week to week. Beside teaching was the natural corollary of the lecture series. The college had already had some success with graduate courses, so a plan was devised by which a joint committee, in which the society and the college had equal representation, pro-

vided new short courses at a convenient hour each week for groups of eight registrants; these courses have been given at the college and in twelve great hospitals of Brooklyn not otherwise affiliated with the college. A wide field has been covered, and the effort made in every case to place the student in direct contact with the patient in the wards. Every physician on Long Island receives a monthly announcement. Some intensive courses given over a long period on diseases of the heart, stomach and intestines, fractures, anesthesia and anatomy have been successful. Courses in gynecologic and obstetric disease and in ophthalmic surgery have been taken by specialists, and a course in measurements of the visual fields has been taken by almost every ophthalmologist in Brooklyn. For convenience, there have been two places for registration: the office of the dean of the college and the office of the librarian of the county society. Registrants must apply in person, fill out an application card, and pay a small registration fee. There is a larger fee for the intensive courses and none at all for the practical lecture series. Every year has shown a steady, healthy growth, and, in its fifth year of graduate courses, without change of any kind in control or organization, graduate education in Brooklyn is a source of mutual satisfaction to the society and the college, and is well and firmly established. Close affiliation of an active county medical society and a medical school seems to be a sound and ideal solution of the problem. The teaching experience and equipment of the college is, of course, invaluable; yet there may be a large amount of clinical material not under college control in hospitals in which there may be many willing and well qualified teachers. To bring about a proper correlation of all the available teaching units, the county society may well take the initiative, because organized medicine is a civic force not to be disregarded. Medical education is not a purely medical problem. Every one has a right to participate in the dividends of modern medicine; consequently, the public looks to the profession. The steadily increasing group consciousness of organized medicine, and its growing desire to assume leadership in the solution of the great problems of public health, fix on it a very definite responsibility. In the continuous education of the practicing physician Gordon sees the greatest single contribution that organized medicine can make, and responsibility rests not on the medical college but on the practitioners themselves.—*Jour. A. M. A.*, April 30, 1927.

MEDICAL EDUCATION IN THE ELEVENTH CENTURY

The first medical school of these times was at Salerno. The beginnings of the school are obscure, but the town of Salerno was known to the Romans as a health resort, and that probably attracted the sick and ailing to the locality in the first place. At any rate, the school was established, and medical education was conducted with great attention to details, and high standards were maintained. There were, first, three years of preparatory work; then four years of the study of medicine, followed by one year of practice with a physician, before the license to practice was given, and an additional year of special study of anatomy before surgery could be practiced. The degree of Doctor given at the end of the fourth year of study enabled the holder to teach only. This was in the eleventh and twelfth centuries.—MUTERER, J. G.: *S. African Med. Assn. J.*, March, 1927.

ROENTGEN RAY IN STUDY OF PHYSIOLOGY

The movements of the living heart, the excursions of the diaphragm, the emptying time of the stomach and the meal's time of passage along the alimentary canal are all physiologic processes of importance that may be taught the student by means of the roentgen ray. For a number of years it has seemed to the workers in the physiologic department of the University of Wisconsin that many problems of the circulation might be advanced if not actually solved by means of the roentgen ray. The heart's reaction to hemorrhage, the effect of phlethora on the diastolic size of the heart, the relation of venous pressure and pulse rate to cardiac size and output may be studied with the roentgen ray.—MEEK, W. J.: *Radiology*, May, 1927.

TEACHING ROENTGENOLOGY TO UNDERGRADUATES

The proper course of instruction in roentgenology for the undergraduate will have the following desiderati: 1. A presentation of the physics of the roentgen ray, not in detail, but sufficiently to give him a good idea of the whys and wherefores of what is to follow; an exposition of the fundamentals of the electrical and mechanical requisites for the production of the roentgen rays, and demonstrations of films, exposures and the fluoroscope. 2. Instruction in roentgen ray diagnosis so designed as to give the student an appreciation of the roentgen ray shadow values on film and fluoroscope in the normal and pathologic tissues as applied in the various specialties in medicine and surgery. 3. Informative instruction in a general way with regard to the therapeutic values of the roentgen ray in the treatment of disease, superficial and deep. 4. The giving of all this instruction prior to the time that the student is to apply it in his clinical studies, that is, his senior year. The amount of time that should be allotted to the instruction in roentgenology ought to be at least one hour per week in the preliminary or technical phases for one school semester, that is, a half-year, two hours per week for one year in the diagnostic phases, and one hour per week for one semester for the therapeutic phases. In this plan a total of about 100 teaching hours will be given, which will prove amply sufficient to properly present the subject to the undergraduate. —BLAINE, E. S.: *Radiology*, May, 1927.

USE OF RADIOLOGY IN TEACHING ANATOMY

Radiology as a method of diagnosis is essentially applied anatomy. Differences in the density of tissues revealed in the fluoroscope or radiograph have to be interpreted in terms of anatomic structure. The greatest contributions to gross human anatomy made in recent years have come from radiology. Today a radiologic outfit is a necessary adjunct of every up-to-date department of anatomy. In a medical school there should be a close and active cooperation between the department of anatomy and that of radiology. In making use of radiology in the teaching of gross human anatomy a few points I think need to be emphasized: 1. Radiographic photographs and films must be conveniently arranged for study if the student is to make as much use of them as is desirable. 2. Legends should be freely used for both photographs and films in order that the student may make use of them without the immediate aid of an instructor. 3. An instructor trained in radiology should always be present when the fluoroscope is used.—BARDEEN, C. R.: *Radiology*, May, 1927.

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